85th YEAR

AMERICAN GAS JOURNAL

FEBRUARY 1944

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FEB 15 1944

LET'S ALL GIVE THIS MAN

a Great Big Hand

Traveling men are today probably operating under heavier handicaps than any other group. With gas rationing, crowded trains and busses (more frequently than not running on late schedules), and hotel accomodations virtually unobtainable in many centers, these "ambassadors of the brief case" deserve a world of credit for carrying on in the face of many obstacles. They neither ask for or receive any special favors, but plug away bringing to their customers about the only thing many have to sell today—service.

Of course, a great number of our products are necessary and vital to the successful pursuit of the war. Other lines have been discontinued entirely for the duration. Selling, as such, is virtually a thing of the past, but engineering and technical assistance, particularly in maintenance and installation work, is very important. We have retained our entire staff, which has been carefully built over the years, to bring those in the field the maximum knowledge and experience in measurement and control.

Some of our service engineers have been temporarily transferred to other jobs in our organization, such as, expediting, engineering and manufacturing, where special talents could be best utilized in producing war goods. They have willingly sacrificed their personal desires in the interests of their Country. When Victory is won, they will again be assigned to their territories to call on old friends whose contacts they sorely miss. These men are now having a hand in writing the future. They deserve a big hand from all who know or have worked with them.

PITTSBURGH EQUITABLE METER CO.

Atlanta **MERCO NORDSTROM VALVE CO.** Boston
Brooklyn Main Offices, PITTSBURGH, PA. Buffalo
Chicago Columbia Houston Kansas City
Los Angeles New York Pittsburgh
San Francisco Seattle Tulsa

National Meter Division, Brooklyn, N. Y.

EMCO Standard Domestic Meter

EMCO Tin Meter for Domestic Service

EMCO No. 4 Meter with EMCORECTOR

EMCO Large Capacity Pressed Steel Meter

EMCO Balanced Valve Pilot Loaded Regulator

EMCO Balanced Valve Regulator with EMCOLOADER

EMCO "1001" Regulator Standard Type

EMCO Type "B" Ejector Regulator

FEB 14 1944

● Some of the skilled [illegible]men at Roper are turning once again to the kind of work they had done for years before the war—manufacturing Roper gas ranges.

These gas ranges are available for you to sell to those who have no cooking equipment or whose cooking equipment is beyond repair. Roper is pleased to lend its efforts to this governmental desire.

Complete with many modern features, the new Roper gas range, now coming down the assembly lines, provides an oven, broiler and top-of-range cooking service. The range can be purchased through the surrender of Stove Purchase Certificates in accordance with provisions of the Stove Rationing Program.

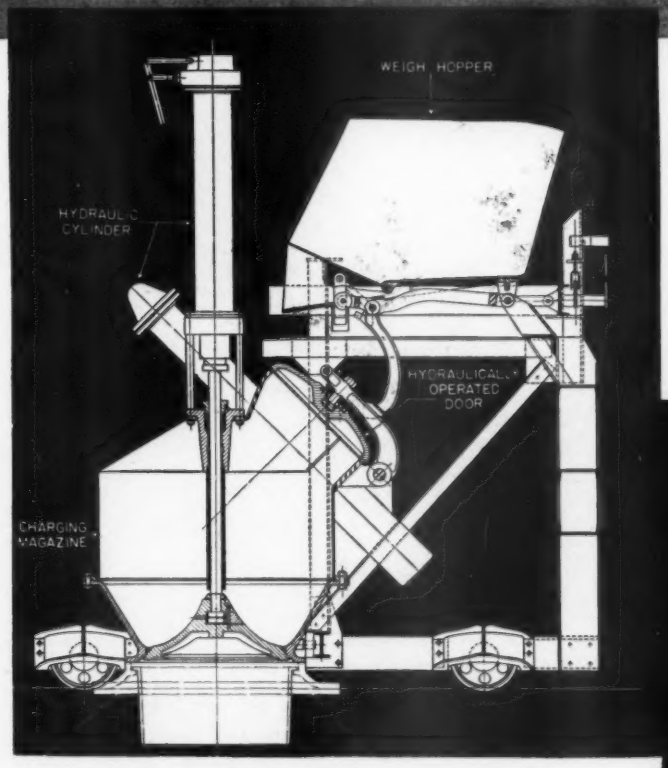
Remember—this gas range bears the name Roper.

GEO. D. ROPER CORPORATION, Rockford, Illinois, manufacturer of ROPER, "America's Finest Gas Range," for all gases including L P (Liquefied Petroleum) gas.

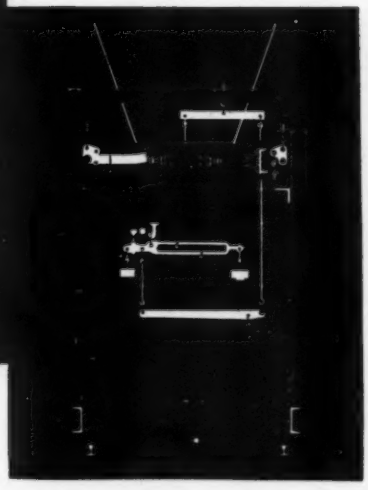
ROPER
GAS RANGES

★ ★ ★ SELL WAR BONDS NOW ★ THE ROPER (lp) GAS RANGE LATER ★ ★ ★

SEMET-SOLVAY *Automatic* CHARGING MACHINE



INCREASES CAPACITY *Saves Labor*



At least ten per cent increase in capacity of your water gas machine can be obtained by the addition of a Semet-Solvay Automatic Charging Machine. Part of the increase is obtained by eliminating shut-downs for charging, part from the added efficiency of a fuel bed of constant depth.

The charger refuels the generator once every cycle during the back-run period. Fuel is accurately weighed by a built-in scale and is uniformly distributed by a hydraulically-controlled spreader. A clamping device gives a gas-tight closure between charger and generator. Seating of the doors is cushioned by the hydraulic cylinders.

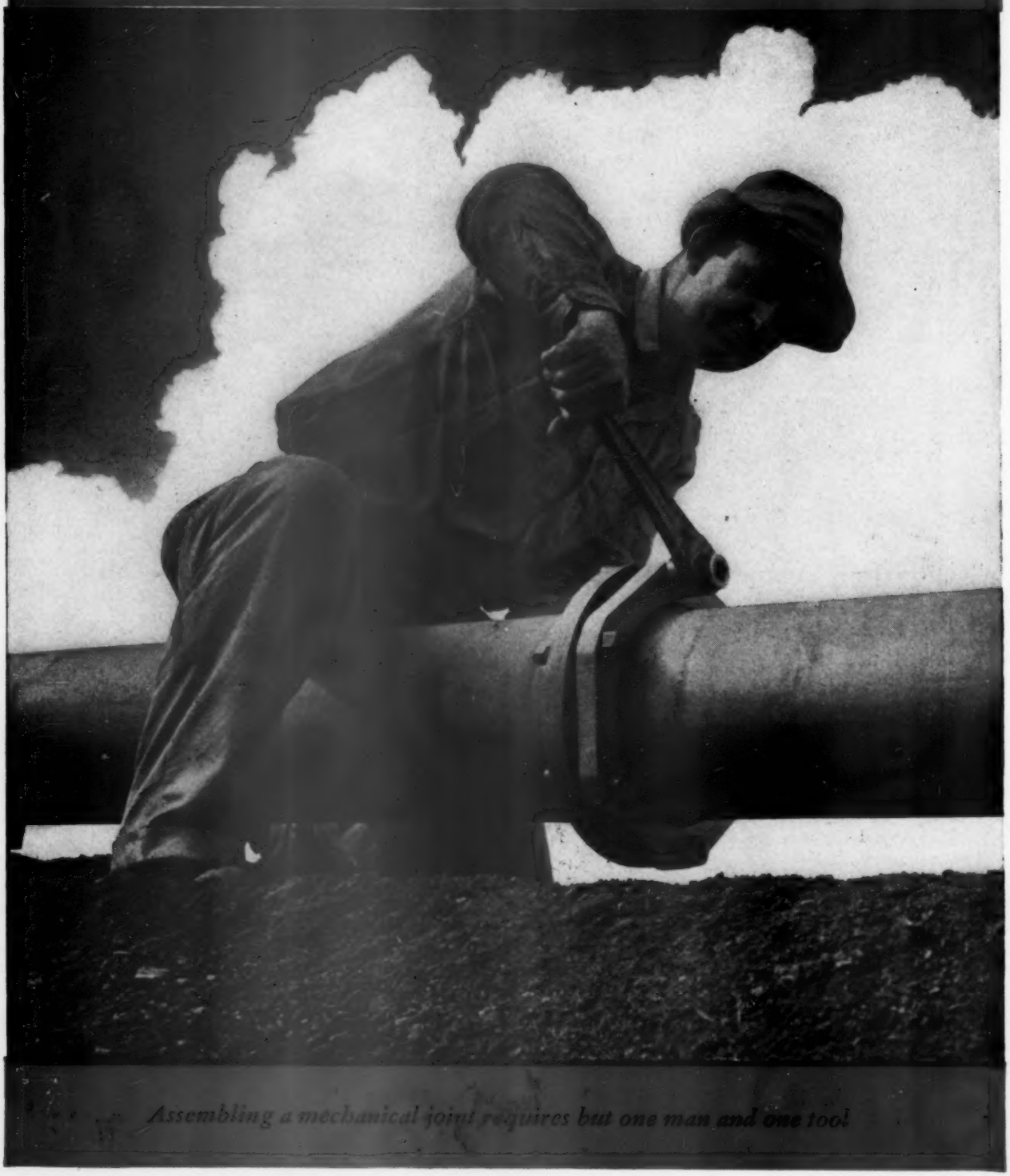
The Semet-Solvay Automatic Charging Machine is built for use with any make of water gas or blue gas machine. Automatic charging is not recommended however when the fuel used is bituminous coal. If you operate on coke or anthracite coal, why not write us for further information and a list of satisfied users.

SEMET-SOLVAY ENGINEERING CORPORATION

40 Rector Street **New York, N. Y.**

AMERICAN GAS JOURNAL, February, 1944. Vol. 160, No. 2. Published monthly by American Gas Journal, Inc., at 34 North Crystal St., East Stroudsburg, Pa. Executive and Editorial offices at 53 Park Place, New York 7, N. Y. Entered as second-class matter, October 7, 1928, at the post office at East Stroudsburg, Pa., under the Act of March 3, 1879. Printed in U. S. A.

Mechanical Joint Cast Iron



Assembling a mechanical joint requires but one man and one tool

Pipe... READY TO SHIP!

Our members are prepared to ship mechanical joint cast iron pipe immediately from stock on hand in storage yards throughout the country. Plant facilities for the production of cast iron pipe and fittings are now, and will be after the War, ready and adequate to meet all requirements *promptly.*

* * *

The extraordinary demands of war construction on the cast iron pressure pipe industry made it mandatory that pipe foundries be kept intact. Now with war construction largely completed, our members can greatly increase pipe production for essential civilian use without interfering with their large and varied production of munitions and other war material.

* * *

If your needs justify it, you can get pipe and get it quickly, if you order cast iron pipe. Remember that mechanical joint cast iron pipe installations in hundreds of gas distribution systems in all parts of the country have been proved bottle-tight under modern service conditions. Address inquiries to Cast Iron Pipe Research Association, Thomas F. Wolfe, Research Engineer, Peoples Gas Building, Chicago.

Send for booklet entitled "Manual For The Computation Of Strength And Thickness Of Cast Iron Pipe—Approved by American Standards Association" explaining the principles and methods which are the basis of the new A.S.A. Law of Design.

CAST IRON PIPE
RESEARCH ASSOCIATION, CHICAGO
CAST IRON
NO. 1 TAX SAVER

ENEMY AGENT

on the

Production Front!

Don't let dust interrupt continuous service

Gas is the perfect fuel for heat treating so vital to the production of armament. But it must be clean to assure constant delivery and easy control. Blaw-Knox gas cleaners do the job efficiently—prevent "Old Dusty" from slowing up the job, retarding Victory!

BLAW-KNOX DIVISION OF BLAW-KNOX CO.
Farmers Bank Bldg.,
Pittsburgh, Pa.

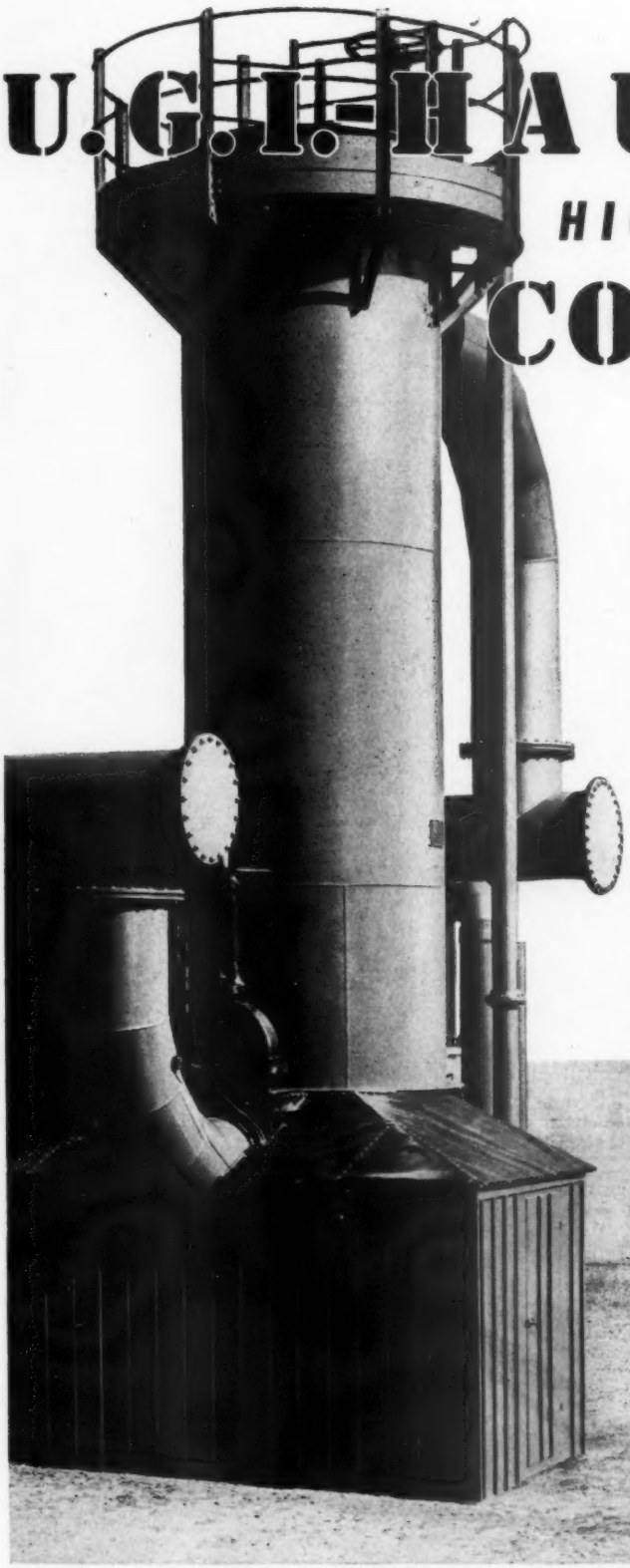
Now available on AA5 Priority or better. Blaw-Knox Gas Cleaners — *as low as* $95

Write for complete details on the ideal low cost "K" series Gas Cleaner for your use. Available in two sizes and three weights for installation in front of industrial meters, at district regulator stations, small city gate stations, etc. State where to be placed, maximum gas volume MCF hour, the minimum and maximum pressure.

BLAW-KNOX GAS CLEANERS

U.G.I.-HAUG

HIGH DUTY CONDENSER



ADEQUATE condensing is an indispensable part of proper gas conditioning and provides an important step in the prevention of liquid phase gum troubles.

U. G. I.-HAUG HIGH DUTY CONDENSERS embodies advanced principles of heat transfer as applied to the cooling of gas and offers the following advantages; ■ High rate of heat transfer— ■ Fresh or salt water cooling design available— ■ Designed to meet your specific needs— ■ Gas cooled to temperature close to temperature of water— ■ Removal of liquid phase gum formers consistent with cooling water temperatures.

U. G. I.-HAUG HIGH DUTY CONDENSERS now on order will have a total capacity to cool over 75,000,000 cubic feet of carburetted water gas per day.

UGI Equipment

UNITED SERVICES PROVIDE

EXPERIENCE IN DESIGN
United has over 50 years experience in gas plant design.

EFFICIENT APPARATUS
United has pioneered major developments in water and coal gas production.

ECONOMICAL CONSTRUCTION
United has large well organized forces for gas plant and general construction work.

EXPERIENCE IN OPERATION
United has experienced plant operators for securing most efficient results.

* U. G. I. SALT WATER CONDENSER, CAPACITY 6,000,000 CU. FT. PER DAY

UNITED ENGINEERS & CONSTRUCTORS INC

NEW YORK PHILADELPHIA CHICAGO

Cp's Answer to AMERICA'S No. 1

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CREATED BY
THE MANUFATURERS OF
GAS RANGES
BEARING THE
FAMOUS Cp SEAL

This program is contributed to the Gas industry by manufacturers of Gas Ranges bearing the CP Seal. All Gas Ranges bearing this Seal are certified to meet the highest performance standards created by engineers and home economists of the entire Gas industry.

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CALORIC GAS STOVE WORKS
CLARE BROS. & CO., LTD.
CRIBBEN & SEXTON CO.
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THE ESTATE STOVE CO.
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JAMES GRAHAM MFG. CO.
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HARDWICK STOVE CO.
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STANDARD GAS EQUIPM'T CORP.
THE TAPPAN STOVE CO.
WESTERN STOVE CO., INC.

You CAN HELP GIVE THEM PEACETIME JOBS

BY PLANNING NOW TO BUY

YOUR NEW Cp GAS RANGE

WITH EXTRA WAR BONDS

Cp AMERICA'S SYMBOL OF

POSTWAR PROBLEM

Jobs for Service Men— Better Business for You

Jobs for service men and war workers — millions of them — that's America's No. 1 postwar problem. Here's a definite, flexible nation-wide plan that will help create those jobs by starting peacetime industry's wheels whirling with a backlog of orders. It's a look-ahead, easy-to-use pre-selling plan that lines up profitable prospects for immediate postwar sales — makes your showroom Headquarters for Postwar Home Planning and enables you to *re-sell* old customers and *pre-sell* new prospects on Gas for Cooking and CP for Certified Cooking Performance.

HERE'S HOW THE (CP) BUSINESS BUILDING PLAN WORKS FOR YOU

1—*Your customers set aside NOW $100 to $150 EXTRA in War Bonds so they can buy the CP Gas Range they want and need immediately after the war.*

2—*From a special easy-to-use CP Postwar Prospect Card you find out EXACTLY what kind of a CP Gas Range your customers want and need and file the information for future follow-up and sale.*

3—*No money changes hands. No contracts are signed. But you can take definite orders and create a priority list if you wish.*

The CP Business Building Plan is practical, timely and as simple as ABC. You can expand it to cover every item on your sales floor. It's a program your customers will welcome because it helps answer a problem all America is thinking about and provides a way for your customers to get the new CP Gas Range they want and need immediately after the war.

Write for Your (CP) Business Building Kit Today

We're backing this war bond selling, job making and sales building plan with nation-wide promotion and a complete kit of dramatic, colorful posters, mailing pieces, publicity, prospect cards, newspaper ads, bond holders and definite plans to help you tie in. Write today for the CP Business Building Kit to Association of Gas Appliance and Equipment Manufacturers, 60 East 42 St., New York 17, N. Y.

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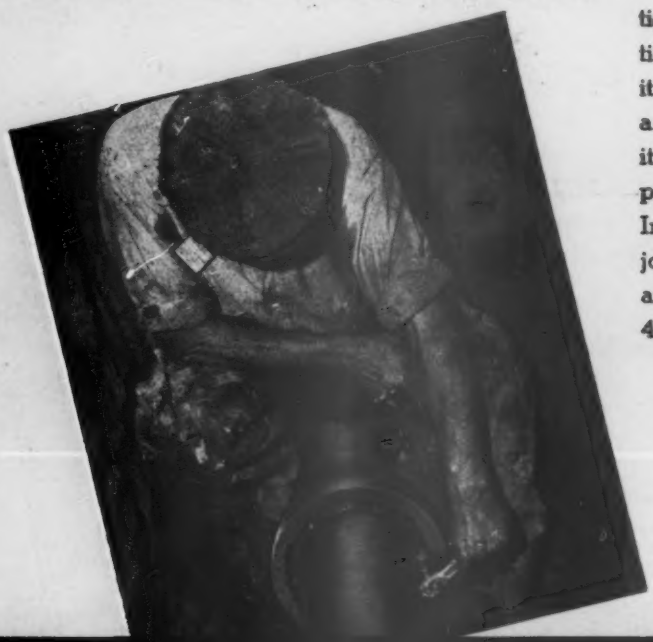
The Latest Development in a Mechanical Joint for Cast-Iron Pipe

The "All-in-One" DRESSER Bellmaster Joint

As cast-iron pipe again becomes available, you naturally take keen interest in a faster and better method of joining it. The compact, tight, flexible Dresser Bellmaster Joint, Style 85, offers you both speed and efficiency.

In the Bellmaster, Dresser engineers have developed a mechanical joint of amazing simplicity. Each joint consists of a resilient rubber-compound gasket compressed by capscrews between two light, strong malleable iron rings. It is shipped, stocked and installed completely assembled.



The Dresser Bellmaster makes up tight and stays tight. Automatically absorbing expansion, contraction, deflection and vibration to an unusual degree, it cushions and protects the pipe while maintaining a constant seal. Locked within the bell of the pipe, it is completely enclosed. No outside lugs, no exposed parts to chip or corrode.

Investigate this latest development in a mechanical joint for C I P. Makers can supply Bellmaster pipe, and we are able to ship joints promptly. Sizes—3″, 4″, 6″, 8″, 10″, 12″ and 16″.

Catalog 413 ARM on request.

Your workman has only one piece to handle — even the newest man on the job can make up tight joints in from two to five minutes with the Dresser Bellmaster.

DRESSER MANUFACTURING COMPANY • BRADFORD, PA.

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WORKING *by instrument*

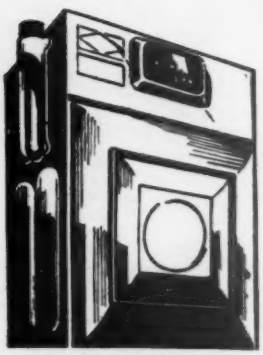
PRECISION measurement and control prevade wartime industrial operations. Drafted to speed up armament production and to multiply the efficiency of striking power, they have become the range finders of industry.

Their advantages—proved so conclusively in the march toward victory—will not be discarded. Post-war industry, more than ever, will find itself *working by instrument* ... and will demand full responsibility on the part of its instrument makers.

●

AMERICAN METER COMPANY'S function always has been the advancement of gas measurement engineering and control. We face the future with confidence that industry's every post-war need for practical measurement will be met.

2085



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FEBRUARY
1944

AMERICAN
GAS JOURNAL

VOLUME 160
NO. 2

Report on Wartime Residential Range Survey

By
James J. Deely
New Business Manager
The Brooklyn Union Gas Company

James J. Deely

THIS IS A REPORT on the completed survey of customers' domestic ranges made by the New Business Department. An interim report was submitted on October 1, 1943, which contained many of the significant results.

Purpose

As stated fully in our request of March 29, 1943 for authorization, this survey was made to "determine the physical condition, the degree of use and operating characteristics of gas appliances and to collect data on wartime relations and thinking of our customers for present and future guidance".

In addition to the information secured, it was felt that the additional customer interviews would be desirable because the number of such interviews has been greatly lessened by:

1. **Curtailment of sales calls. These normally amounted to 100,000 visits per year to the homes of our customers.**
2. **Bi-monthly billing and collecting system.**
3. **Curtailment of service calls by Distribution Department. In 1942, these were 20% less than in 1941. Based on the 1942 record of range maintenance calls, we are reaching each user of a gas range, on the average, approximately every seventeen years.**

This survey was made to obtain factual information on domestic cooking in the homes of our customers. Fundamentally, the information sought was:

1. **Present physical and operating condition of gas ranges now installed.**
2. **Customer opinions of their gas ranges.**
3. **Customer thoughts on improvements desired in future ranges.**
4. **Customer thoughts on our service.**

This survey has been beneficial to our Company from several viewpoints. We not only had a pleasant visit with a large number of domestic customers, but, in addition, definitely raised their opinion of us and our fuel. We rendered service which was highly appreciated and learned considerable of what our customers are thinking, particularly among classes of people whom we ordinarily do not reach in any great number. The sales personnel who did the survey work received invaluable experience which will be of help in future selling. The information gained will be of value to us and appliance manufacturers in formulating future policies and practices in both sales and service.

Method

Originally, it was planned to include in the survey an inspection of all domestic gas appliances in the homes visited. As a result of numerous experimental calls, it was found that because of the excessive amount of time required per call, it was desirable to limit the survey to ranges.

As in all such surveys, the soundness of results and conclusions rests to a great extent upon the correctness of the average sample areas selected. Inasmuch as only a small percentage of all customers could be interviewed, care was taken in the selection of representative areas based on types of dwellings, purchasing power and a wide knowledge of the territory.

The questionnaire used was designed to secure two general types of information, namely:

1. **Data based on the observations of the interviewer regarding the present range and a record of the adjustment work performed.**
2. **Reactions and opinions of the customer anent the design of a post-war range.**

Because of these two distinct objectives, the recording of information on each objective was kept separately and different survey report forms used to record each. A copy of each questionnaire is appended. In a great many homes it was possible to obtain information regarding the present range but no worthwhile opinions on the design of post-war ranges. For these reasons and also to simplify presentation and analysis of results, we have considered that

two surveys were made. In some homes, both were completed, in others only one.

As a part of the survey, adjustments were made where necessary on all ranges inspected. This free service facilitated the interviewing of customers. The interviewers were given a thorough basic training in the making of range adjustments.

At the conclusion of the survey, a letter was sent to five hundred customers who had been interviewed asking their reaction to the visit and whether the operation of their range had improved. Eighty replies were received.

Most of them are illuminating and many are extremely valuable in that they represent the opinions of customers who not only gave the subject some thought but who also took the trouble to write us a letter about it. Throughout the replies, the three following reactions are found to predominate:

1. **An appreciation of a gratuitous and unexpected service by the gas company.**
2. **Range reported as operating more satisfactorily.**
3. **Realization that faulty range operation is not a necessary evil but rather one that usually can be corrected by simple adjustments.**

Coverage and Personnel

Field work was completed on October 29, 1943. The following tabulation indicates the number of each type of questionnaire completed.

Part I regarding present ranges	**6,145**
Part II regarding post-war ranges	**3,090**
Total:	**9,235**

A sufficient number of customers was interviewed to arrive at a true average sample. This was indicated by the consistent similarity of data and information secured when analyzing the questionnaires in groups of one thousand.

Presentation of Results

In order to analyze and present definite data from a mass of observations and opinions, it was necessary to frame our questions so that answers could be categorically recorded under definite headings. By this method, most of the information secured could be tabulated by our Remington Rand machine equipment. This almost mathematical method of question and answer does not permit of varying shades of opinion. It is, however, the most practical means of classifying mass data of this kind.

Summary of Results Part 1

Age of Range

The estimated average age of all ranges in our territory is between nine and ten years with a probable additional life of seven years. Their physical condition was found to be good, indicating that they will last for any probable war period. Based on the opinions of the interviewers, 18% of all ranges can be considered, by normal standards, to be in need of replacement.

Insulation

Twenty-nine percent of all ranges are fully insulated, 25% are semi-insulated, while 46% have no insulation. These figures are not correct for ranges sold in recent years. They are descriptive, however, of ranges now in use by the operation of which the public passes judgment on gas as a cooking fuel.

Condition of Top Burners

Eighty-eight percent of the ranges inspected had top burners in good or fair condition. However, 59% of the ranges had one or more top burners which were poorly adjusted. In view of the fact that most cooking is done on the top burners, this average poor condition is disquieting.

Top Burner Pilots

Sixty-seven per cent of all ranges have a top burner pilot, indicating a considerable number of very old ranges or ranges from which the pilots were removed. Of those ranges which were pilot equipped, it was found that 23% were not in use and were relighted, and 43% adjusted.

Size of Range Ovens

In 93% of the homes visited the size of the oven was considered satisfactory, indicating that present design is generally correct.

Condition of Oven Linings

A high percent (88%) of the oven linings were found to be in good or fair condition. The predominating defect in the balance was rusting.

Automatic Oven Pilots

As might be expected, only 3% of the ovens are equipped with automatic means of ignition. Of equal or greater interest is the fact that on 38% of the ovens so equipped, the pilots were found to be operating poorly or were not in use.

Broilers

As expected, an overwhelming percentage, namely 92%, do not have a separate broiler burner. All broiler and oven burners appear to be in better condition than top burners. Less than 10% needed adjustment. Since only 35% of the broiler trays were of the smokeless type, a large portion of the people do not enjoy this desirable feature.

Oven Heat Control

Indicative of increasing acceptance of this feature, it was found that 30% of ranges are so equipped. Of these, 25% were found to be inaccurate; some were out of calibration enough to make them of little use.

Steel Wool in Range Flue

We found steel wool had been placed in 7% of the oven flues. This is supposed to reduce the discoloration of the wall and ceiling by removing grease vapors from the oven flue products. This practice is hazardous. We were permitted to remove the steel wool in 77% of these cases.

Shut-off Gas Cock in Kitchen

It was found that in 77% of the homes a shut-off cock had been installed on the gas line supply of the range. Of these, 89% were accessible and therefore readily usable.

Service Work and Repairs

The following figures show in actual numbers the amount of adjustment work performed.

Top burners adjusted (ranges)	**3,598**
Top pilots adjusted	**1,559**
Pilots relighted	**417**
Oven burners adjusted	**394**
Oven pilots adjusted	**11**
Oven heat controls adjusted	**335**
Steel wool removed from flue	**321**

In two hundred and eighty-five cases customers were referred to the Customers' Service Division or other agencies for parts and service.

The greatest interest in the purpose of the survey and appreciation of the range service work performed were shown by owners and tenants in one and two family residences. Tenants in multi-family dwellings showed little interest.

Part 2

The following presents the more significant findings from Part 2 of the survey, which records the thoughts and reactions of customers to their present range and new range features. No attempt was made to sell or influence the opinions of persons interviewed on any of the suggested innovations for post-war ranges.

Opinion of Present Ranges

Eighty-five percent of the customers expressed satisfaction with their

present ranges. Only 15% expressed dissatisfaction. There was no single outstanding reason given. The objections included:

Lack of heat control
Difficulty in cleaning
Smoke from broiling
Lack of insulation
Low broiler

Range Top Design

In 92% of the interviews, a preference was expressed for four top burners. It is of interest that almost exactly the same number (91%) have four top burners. Regarding top burner arrangement, 59% prefer the conventional four burners located on the right or left side. The remainder are about evenly divided among other less common layouts. An overwhelming majority, namely 92%, consider that working space on the top of the range is essential.

A built-in electric lamp on top of the range was found in 7% of the homes. Of the customers having ranges so equipped, 32% do not use them.

Ovens—location and visibility

Although 93% expressed a preference for a table height oven, there exists an undercurrent of desire, not always forcefully expressed, for a real high oven because of the greater convenience and visibility.

More than half (59%) expressed a desire for a glass panel in the oven door; fifty percent want an electric light in the oven.

Broilers—use and location

It is generally known that many customers make little use of their broilers. However, when questioned, 70% of our customers stated that they used them considerably. Our observations indicate that the use of the broiler varied widely in different neighborhoods and nationalities. On the question of broiler location, most housewives want the broiler to be as high as possible but not at the expense of lowering the oven or radically changing the appearance of currently accepted styles.

CP Ranges

Although there has been no local and very little national advertising on the Certified Performance range in many months, fourteen percent of the people interviewed were familiar with it. This means that our past efforts to establish this appliance were successful.

Range Features Desired on New Range

	Desirable	Unnecessary	Don't Know
(A) Automatic oven lighter	46%	26%	28%
(B) Deep Well Cooker	17	28	55
(C) Automatic Timer Clock for Oven	21	23	56
(D) Automatic Timer Clock for Top Burners	16	28	56
(E) Oven Heat Control	94	3	3
(F) Top Griddle	29	45	26
(G) Coverall for top burners	91	5	4

Color of Range

Indicative of a trend away from color in range finishes is the high percentage (91%) who prefer white.

The foregoing indicates a preference for those features which are well known and already have considerable public acceptance. Style and up-to-dateness influence customer opinion at least as much as utility. For instance, coveralls are desired but little used except for special occasions.

Toasting and Coffee Making

The survey shows that eighty-nine percent use electric toasters, but that ninety-six percent use gas for coffee making.

The report includes a summary of general observations, copy of the letter sent to customers interviewed, excerpts from typical replies and the several typed 8½x11 forms for tabulating results. These are omitted here for lack of space.—Ed.

Excerpt of Committee Report Presented at the September 1943 Meeting of P.C.G.A.

AT THE annual meeting of the Pacific Coast Gas Association, held last September, a report of the "Committee for Gas Industry Development," was presented by H. L. Masser, Chairman and Executive Vice-President of Southern California Gas Company.

The report covers a number of subjects, but the AMERICAN GAS JOURNAL presents herewith only that part of the report covering the recommendations for the improvement in design of gas ranges. The report states in part:

"Few, if any, of our important manufactured articles or machines have reached the degree of perfection that precludes further improvement; look, for example, at the automobile which has come forth from year to year with radically changed designs and constantly better performance. With equal verity, our gas ranges are susceptible to many improvements as to design and performance, and to thereby achieve greater customer appeal and satisfaction. The automobile industry is not now involved by competition between two entirely different types of power. A single industrial group, the oil companies, supplies all of the energy. On the other hand, the range industry has two primary factions: the gas group and the electric group; with the energy supplied by competitors. Because of the intensity and seriousness of this competition, the gas industry cannot for one minute afford to let its aggressive electric adversary go unchallenged. For the security of our business, it is the responsibility of the combined gas industry to produce and maintain an output of ranges that are superior to all competitors. The gas range is our key appliance.

"To accomplish this purpose, we must frankly and thoroughly analyze the design, performance and construction of our present equipment, and then endeavor to produce new appliances which best meet most of the desirable features and particularly have "eye appeal." This will require the joint efforts of the utilities and the manufacturers. The utilty needs from the manufacturer ranges which can be sold readily because of actual customer preference, and backed up by good construction and thorough testing to assure reliability of service. From the other side, the manufacturer needs to know from the utility the specifications required for the range to successfully top the competitive market. Further, both utilities and manufacturers need

to know what their competitor is going to produce and promote, and what are the particular merits of his appliance. It is of primary importance to the manufacturers that an early determination be made of utility sales policies. If the utilities can establish and follow a reasonably unified and well balanced sales plan for a few years, it would be of tremendous help were manufacturers to undertake the extensive redesigning of appliances which the utilities now desire. If gas range designers are sufficiently smart, and manufacturers are able and willing to meet the development and production costs of new and superior designs, the proper percentage of the future cooking load will be retained by gas and be soundly justified, by its fundamental advantages of speed, flexibility and economy. This cooking load also provides much assurance for securing and retaining the water heating load and these two items constitute the backbone of domestic gas service.

"Dealers in promoting any given type of appliances, virtually control what the consumer buys. It is therefore our responsibility to make sure that the dealer has to offer the attractive and modern appliances that will keep public opinion in favor of gas.

"Information on customers' opinions, supplemented with extensive performance experience, can best be supplied by the utilities' sales departments, home economics departments, service departments and testing laboratories. This Association currently has a "Post War Appliance Committee" whose report is being presented at this convention, however, this report primarily summarizes an expression of customer preference, which, of course, can be of great value to manufacturers, but probably does not sufficiently cover the purpose of this committee for specific recommendations on appliance design. Likewise, the A.G.A. Post War Sub-Committee on "Potential Markets" has a committee report on "Customer Preference." In view of the desire of our two associations to cooperate and coordinate their work on post war planning, it appears appropriate to give consideration here of the points suggested by the A.G.A. committee, and we in turn submit our suggestions to them.

"These two extensive expressions of customer preference may well be taken as a reliable guide or directive as to the specific design recommendations which the utilities should present to manufacturers. The following is a composite summary of the combined P.C.G.A. and A.G.A. committee suggestions, together with ideas of this committee, but limited to points which have received the most weight or which may be considered the most practical."

Suggested Improvements for C. P. Range Design

A. Top Surface

Uniform level top surface with grids at same height, which do not wabble or cause kettles to slide off, but still permit easy movement. One-piece top, neatly joining back with rounded corner for easy cleaning. A surface finish that does not quickly deteriorate, crack, craze or discolor from heat and use and with smooth grids. Investigations should be made as to the real desirability of top covers. If the top surface is sufficiently neat and attractive, covers may not be desirable. If top covers are used, they should move conveniently out of the way, without obstructing other parts of the range, and could be made to operate a valve to shut off the gas burners when covers are down. Sufficient top surface area and space between burners to accommodate four large utensils is desired by most cooks. Easily removable and cleanable drip pan should be provided. Well located top surface light is needed.

B. Top Burners

Burners easily cleanable, preferably of bright or polished metal. Time or temperature control for one or more burners (to prevent burning of foods.) Simmer burners which spread heat to avoid localized central hot spots. Reduced heat from pilot lights, easily serviced and relighted. Valves located away from hot zones; strong, smooth handles that do not come off easily, with safety latches. Valves readily serviceable.

C. Ovens

At least waist-high, large sized (at least 18 inch), with door window, reliable temperature indicator and interior light. Well insulated, with close fitting door to prevent heat leakage and keep low exterior surface temperatures. Easily cleanable interior lining with minimum number of joints. Smooth, flat surface, bright finished, sliding racks that are rugged and don't wabble when drawn out to stop latches, adjustable to 4 or 5 positions. Quick temperature rise and good heat distribution for even baking. Separate small or pastry oven. Door springs located out of hot zone, or easily replaceable or no-spring counter balanced door. Improved oven venting to carry away vapors, to optionally dispose of or utilize waste heat for kitchen warming or other purposes.

D. Broilers

Waist-high, with door window, drawer type, easy opening and rolling with stop, separate from oven. Well vented so as to be really smokeless. Bright metal (not enameled) drip pan, easily cleanable, with deep well grease drainage. Grid adjustable to broil close to flame.

E. Accessories and General

Simplified controls, simplified clock setting. Easier servicing of controls, safety pilots, valves and piping. Electric oven ignition? *Very much better venting arrangements* for the oven, broiler and top surface; vent easily cleanable, neat and effective. Range to fit flush to wall and to floor with toe space. No exposed bolts or open joints; have rounded edges. Have choice of colors. Large, smooth bearing plates or feet to permit easy sliding on floor when necessary. Include warming compartment. Have model with deep well cooker and utensil which may be used as pressure cooker. Standardize dimensions and general designs to improve the all gas kitchen "ensemble."

"The incorporation of all the foregoing suggestions would, of course, result in a super-deluxe model, but there would also be the need to provide medium sized and priced models for which the major demand would exist. However, it appears that there is no good reason why most of the desirable operating features and attractiveness listed above cannot be included in our new model ranges. It is proposed that a committee be formed to thoroughly study gas range designs and collaborate with manufacturers through their associates for the purpose of developing practical plans at an early date that will assure the gas industry of having ranges that will command customer preference."

Domestic and Industrial Sales Force in Denver Now Operate as Service Groups

By
Lucius S. Flint

BY CONVERTING its domestic and industrial gas sales forces into home and industrial advisory service organizations, the Public Service Co. of Colorado in Denver is doing a remarkable job of equipment and gas conservation and at the same time is building potential future volume.

The minute it became evident that merchandise would soon be unavailable, the company began switching a few men at a time to form the nucleus of the new service groups. Today, all 26 members of the former domestic gas sales force have become service representatives. The same thing holds true in the industrial gas department.

In both departments, the men are performing invaluable service in helping subscribers conserve both equipment and gas. They're obtaining information on future appliance needs. They're doing an all-around job of good-will building. And, the minute equipment again becomes normally available, they'll be ready to tackle the post-war promotional job. Good salesmen to begin with, these men have obtained a very helpful additional education in their service work. When the time comes, they'll comprise one of the best sales forces in the nation.

To fit the former salesmen for really effective advisory service work, the Public Service Co. put them through an eight week training course in the shops. Here they learned all about the mechanics of various types of appliances, actually making repairs and adjustments during the final weeks of the course.

When fully trained, the new advisory service men were put into the field to make house-to-house contacts with subscribers. Each man has an assigned territory which he covers completely over a period of time.

Besides making routine canvasses, the men are on call to help subscribers in any way possible. For example, if a user finds that an appliance is no longer serviceable and wants information on how to get another one, the advisory service representative will call and explain the procedure and furnish necessary forms.

In his regular contacts, the service representative does three things:

1. **Shows the user how to get longer life from her equipment.**
2. **Makes needed minor repairs or adjustments.**
3. **Inspects equipment from a preventative maintenance viewpoint: where he discovers trouble brewing he advises repairs while they'll still do the most good.**

Since Denver has nearly a 60 per cent saturation on gas water heaters, particular concern was felt for the preservation of this equipment. Therefore, one of the first things the service representative does on every call is to give a few simple rules for lengthening life of this equipment. The customer is instructed not to set the thermostat too high—to keep it at 135 or 140 degrees. She's asked to drain out a bucket of water every two weeks and so on.

Incidentally, Public Service solved its essential tank replacement problem to a large measure by obtaining a supply of black iron tanks from a local firm. A stock of several hundred was obtained and is being fed out with the utmost care.

While in the home, the representative usually obtains permission to inspect and adjust every appliance on the line. This step is the prelude to securing certain information on post-war needs.

Wherever possible, the representative obtains the following information on all types of appliances: number active units in each classification, age, condition; number inactive units of each type and whether the user is willing to sell them; appliances which the customer intends to buy after the war.

A permanent card record covering this data is made out on each subscriber contacted. By the time the survey is complete, the company will know exactly what appliances will be most in demand after the war. And they'll have a tremendous list of active prospects for every type of appliance. The survey data will be made available to appliance manufacturers as a guide for post-war planning.

The information obtained as to inactive equipment in homes has led to development of a sizeable stock of

Advisory Service men discuss mutual problems at morning meetings

NAME TERRITORY

ADDRESS DATE

FAMILY A C TYPE OF RES.

APPLIANCE	No. Active	Age	Condition	No. In-Active	Will Sell	Pros. P.W.	REMARKS
H.H. Coal							
H.H. Oil							
H.H. Gas							
Heatrola							
Hot Air							
Stove							
Radiator							
Stoker							
Range							
Refrigerator							
Room Heater							
Circulating							
Radiant Fire							
Water Heater - Coal							
Automatic, Storage							
Side Arm							
Incinerator							

Note:

APPLIANCE	No. Active	Age	Condition	No. In-Active	Will Sell	Pros. P. W.	REMARKS:
Cooker or Roaster							
Dishwasher							
Fan - Desk							
Fan - Ventilating							
Fixtures							
Hot Plate							
Iron - Flat							
Ironer O or E							
Lamp - Portable							
Lamp - IES							
Mixer							
Percolator							
Radio							
Range							
Refrigerator							
Room Heater							
Sun Lamp							
Sweeper							
Toaster							
Waffle Iron							
Washer							
Water Heater							
Water System							
Wiring							

Note:

Rep.

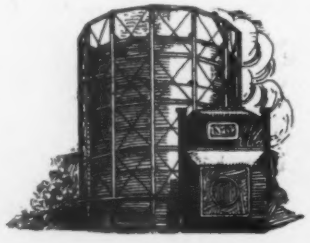
The two sides of a 6" x 4" permanent record card of domestic customers

used merchandise, a stock that's providing much needed service for the thousands of newcomers to this area. Of course sometimes the owner won't sell immediately. But, having a list of unused appliances of different types, the service men follow up when certain equipment is badly needed.

In the first 3500 homes surveyed on postwar needs, the greatest demand indicated was for automatic storage heaters and gas ranges.

While there would be no difficulty keeping the repair departments busy even without the advisory service crews in the field, still their work has made much more efficient and profitable the entire shop setup. By making minor repairs early in the game, the advisory service men anticipate trouble which would otherwise swamp the service facilities. And, where shop service is going to be needed, they advise the customer of this fact and schedule the work far enough in advance to avoid emergency demands. No particular effort is made to sell repairs. If the customer has an independent appliance dealer in mind, she's told to go ahead and deal with him. But where repairs are required, she's always urged to act promptly.

Another interesting activity of the advisory service men is the distribution of late information on food preparation and preservation methods. For example, during canning season, booklets on this subject were distributed at all homes contacted. Literature was put out on dehydration. Still other material distributed covers methods of cookery for preservation of war-time food values.



Commercial Surveys Save Gas and Equipment

In the commercial department, former salesmen are devoting their time mainly to fact-finding and customer service of a type that will save gas and conserve equipment.

Every restaurant in the city is being covered in a special survey showing the equipment in use, its condition and other pertinent facts. This data is again compiled in permanent form.

In making the fact-finding calls, the commercial advisory service representatives also inspect equipment, making minor adjustments and giving recommendations for repairs. The hotel and restaurant equipment repair man alone is making 25 or 30 repairs a month in follow-up of the advisory calls. A majority of these jobs are of a preventive type—in anticipation of breakdowns which would lead to emergency calls.

All industrial users are now being surveyed too. In this survey, the company obtains complete information on personnel of each industrial user, together with home phones of key people, data on type of gas usage (whether for war work or not) and a list of equipment.

Where a need for standby equipment is indicated and none is in place, the advisory representative makes recommendations along this line and helps work out necessary plans. If one plant has used equipment available for sale, a record is made of this and establishments that need this type of equipment are referred to the proper party.

A constant follow-up is maintained on industrial and commercial users. If recommendations aren't carried out promptly, a call-back is made and the idea is re-sold. Every possible effort is made to see that gas usage is held to reasonable levels and that on-line equipment is conserved. Where there's idle equipment, the company tries to get it into service where it's needed most.

By the time these surveys are complete, Public Service will have at its fingertips a complete picture of gas and equipment usage conditions in every commercial outlet. If an emergency occurs, the background data will prove invaluable. And, meanwhile, customers are getting better satisfaction from their equipment than ever before.

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LAVINO ACTIVATED OXIDE: Supplied in unmixed form ... ready for mixing with your own carrier ... Lavino Activated Oxide is readily adaptable to the needs of your plant, whatever its size or requirements. Composed of 70% (guaranteed minimum) to 78% Fe_2O_3 as received; approximately 10% moisture.

LAVINO ACTIVATED SPONGE is furnished ready mixed, carefully coated on large, tough, specially selected hardwood shavings.

Made in the United States, and readily available.

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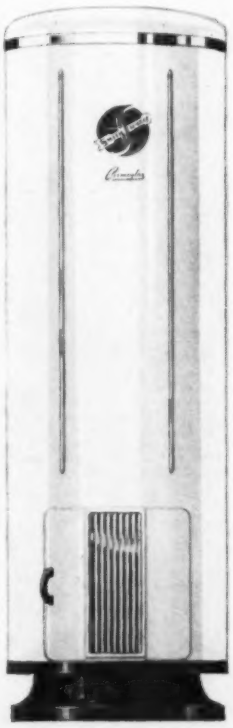
YES—there's only *one Permaglas* and nothing else like it—if you are interested in selling *profitably* in a market that is demanding *newer* and *higher* standards of perfection in hot water convenience, sanitation, and cleanliness.

Permaglas IS actually glass—a smooth, lustrous, sanitary blue glass lining, permanently fused to the inside of the steel tanks in SMITHway Automatic Gas Water Heaters. It's a good name to remember—*Permaglas*—your proof of quality—your profitable source of customer satisfaction in the automatic water heater field. *Permaglas* has a real *inside* story that you will want to know more about.



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GAS
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Gas Men hear story at 45 meetings

Utilities take another step ahead in preparing for Post-war Gas Air Conditioning

Enthusiasm for *All-Year* Gas Air Conditioning reached a new high as a result of 45 successful two-day conferences already held throughout the country. Other meetings are still to be held. But the response accorded the meetings to date is concrete evidence of the Gas Industry's leadership in post-war action now and in its sincere desire to help provide post-war employment.

At many of the conferences, actual attendance was *greater* than original registrations! And the men not only came for the first full day of discussion, but returned the next day for more!

Running concurrently with the meetings—as an integral part of Servel's Plan of Post-war Action—is a factory school at Evansville for Gas Company engineers and service men. Here, these men receive complete instructions on sales, application, installation and service. When the course is completed, they are fully prepared to go back to their respective Gas Companies to teach their own local staffs.

Yes, *All-Year* Gas Air Conditioning is really on its way! And every Gas Company will want to take full advantage of the opportunity now presented to thoroughly educate those who will influence the sales of this equipment when peace comes—namely, architects, builders and real estate men. Now is the time to lay a solid foundation of market development for sales and prosperity after the war.

Another step in . . .

Post-war *action* ~~planning~~

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"CLEVELANDS" Save More . . . Because they Do More

Underground Storage of Natural Gas

In the February issue of the "West Virginia Engineer," published by West Virginia University, is an article on "The Storage of Natural Gas," by J. French Robinson, President, The East Ohio Gas Co., Cleveland, O. We reprint the part of Mr. Robinson's article covering underground storage of natural gas.—Ed.

J. French Robinson

NATURAL GAS can be stored by four general methods: first, as gas at low pressure in the conventional cylindrical gas holders; second, as gas in gas holders under medium pressures of from five to twenty-five pounds; third, as a liquid, at extremely low temperatures in well-insulated alloy steel tanks; and fourth, underground, as gas, at high pressures in the pore space within certain geological horizons, usually in depleted or partially depleted natural gas fields.

It is only in the past few years, however, that underground storage of natural gas has been developed into its present and fast increasing usefulness. The demands for gas for civilian use and for war industries have increased by leaps and bounds all over the United States, and in many cases the available gas supplies have not been sufficient to meet these demands. In some instances curtailment in delivery has resulted.

This situation is particularly pressing and increasingly critical in the vital industrial areas centering in Cleveland, Pittsburgh and Wheeling. These communities, for the most part, obtain their gas supply from the great Appalachian gas producing area where gas is produced from many horizons, varying in geologic age from the early Pennsylvanian to the Silurian. The natural gas reserves of this region are about six per cent of the total natural gas reserves in the United States, but the users supplied from it consume about sixteen per cent of all the natural gas sold in the United States. The discrepancy between these two figures tells its own story.

The Appalachian fields are fighting a losing battle against depletion, and because of it, and in order to maintain deliveries and service, many of the operating gas companies dependent upon Appalachian supplies, long since found it necessary to establish underground storage areas for seasonal reserves. Their development and extension are accelerating.

Another factor which has hastened the development of underground storage of natural gas has been the rapid growth of long distance pipe lines. Economy dictates that these lines be operated at full capacity at all times. It has therefore been necessary to provide underground storage in which to accumulate surplus gas from the pipe lines during periods of low demand.

Underground storage areas are usually filled during off-peak periods by one or more of the following practices, sometimes simultaneously:

(a) withdrawing gas from highly competitive areas;
(b) continuously taking gas from a large number of small low-output wells that cannot be turned on and off economically to meet changing demands;
(c) using the surplus capacity of long distance pipe lines.

The following factors are to be considered when selecting and locating an underground storage operation:

1. **Location—adjacent to large distributing centers.**
2. **Size—**
   (a) Small, if it is to be used for peak hour and peak day demands; with high rock pressures so that large volumes can be withdrawn in a short time.
   (b) Large, if it is to balance out a system or to balance out the load factor on a long distance pipe line.
3. **Type of Reservoir—Size of Wells—**
   (a) Porosity of gas bearing stratum.
   (b) Its permeability.
   (c) Freedom from water.
   (d) Structural features, including faults, etc.
   (e) Control of wells and acreage by the operating company.
   (f) Storage rights.
4. **Compressor Station Site—**
   (a) Available land.
   (b) Accessibility to water.
   (c) Proximity to storage area or areas.
   (d) Nuisance risks involved such as noise and vibration in neighboring communities.
   (e) Transportation—
   1 Employees,
   2 Materials.
   (f) Nearness to main distribution or trunk pipe lines.
   (g) Number of operating wells.
5. **Legal—The legal aspects and ramifications of the rights covered by an underground storage reservoir are many. Contracts must be negotiated with all well owners and land owners in the area for the rights to repressure gas through the wells into the storage horizon, to store the same, and to withdraw it.**

It is important that all of the acreage and wells in an underground storage area be owned or controlled by one operator, or by a single group of operators, so that the entire area can be operated as a unit. If this principle is carried out, no cross-operating is developed and no gas is lost during the storage process.

In a properly selected storage area, there should be no loss of gas during the storage process, whether by migration to uncontrolled areas, or by withdrawal from uncontrolled wells. This can be checked by comparing the amount of gas that must be injected into the area to raise the rock pressures a given amount with the amount of gas that must be withdrawn from the area to reduce the rock pressure the same amount. If the quantity withdrawn is equal to the quantity injected, there has been no loss during storage.

If the selected storage area is near both high pressure say (five hundred pounds per square inch and over) and medium pressure (say one hundred pounds per square inch and under) pipe lines, the area can be filled from the higher pressure line and emptied into the lower pressure line without the use of a compressor station. The practical pressure differential depends upon operating factors.

In most cases, however, a compressor station must be built near the storage area to take gas from a feed

line and force this gas into the pore space in the gas horizons. Pressures used in this process are in excess of one thousand pounds per square inch.

Some of the best underground storage pools with which I am familiar are located in Pennsylvania, West Virginia, New York and Ohio. Some of the sand horizons used are the Murraysville, the Fifty-Foot, Gantz, Oriskany and the Clinton. Of course, there are many other horizons used for underground storage.

To illustrate the operating conditions of an underground storage operation, I can best use the Chippewa area of The East Ohio Gas Company. The limits of this pool are completely controlled by stratigraphic trapping. Its area covers approximately six thousand acres, has eighteen active wells, and a 1020 H.P. compressor station. Storage actually began in this pool the latter part of 1941, at which time the rock pressure was 416 pounds. This pressure has been built up to 1,000 pounds, and at this pressure the total amount of gas in storage is 6,000,000,000 cubic feet, which includes 3,250,000,000 cubic feet of gas reserves in the area at the time underground storage started. At the pressures given in the table below, gas can be withdrawn from the area in the following quantities per day:

1000 lbs. pressure—	25,000,000 cubic feet
900 lbs.	22,000,000
800 lbs.	17,000,000
700 lbs.	14,000,000
500 lbs.	8,000,000
400 lbs.	4,000,000

To lower or raise the rock pressure one pound, 12,300,000 cubic feet of gas must be withdrawn from or forced into this storage area. The total cost of this storage area is $1,000,000, including the 3,250,000,000 cubic feet of gas in reserve prior to the time storage was begun.

It is of interest to note that in the old McKeesport, (Pennsylvania) gas field, one of the big companies operating in the Pittsburgh district has for a great many years stored coke oven gas in the Speechley sand, pressuring the gas in this underground storage area during weekends when more gas was produced than could be consumed, and withdrawing it during the week when the demands for fuel exceeded its production.

In conclusion it can be said that each of the four methods of gas storage has its peculiar and particular place in the operation of gas properties. The first three, medium and low pressure storage in holders, and storage of gas in liquid form, perform highly particularized, perhaps narrowly specific functions in maintaining balances between gas supply and consumer demand. But in addition to all of them being vital factors in company operating, the full, broad impact of underground storage on the national economy, as well as the natural gas industry, can be judged from the fact that, as of December 1, 1943, the underground gas storage capacity of the areas in the United States now in use for that purpose was 135,000,000,000 cubic feet, with a delivering capacity of 750,000,000 cubic feet a day.

Socially, the potentialities of underground natural gas storage are as great as its economic significance. Perhaps they are the same thing, for great industrial communities, whole chains of industrial communities have been built up about natural gas deposits, and with a dependence upon natural gas. Depletion is inevitable. You can't burn your gas and have it too. Depletion comes to all natural gas fields, even the greatest. The Appalachian fields are an emphatic illustration of this. Yet natural gas deposits exist in other and distant sections of the country, which are far in excess of local community demands upon them. The relating of these natural gas deposits, with an excess of production capacity, to communities whose millions of people are dependent on diminishing or already inadequate natural gas supplies, can be regarded almost as a social and economic "must."

Long distance pipe lines are the answer, of course—but they are only one part of the answer. Underground storage, strategically located, and adequately calculated for their purpose, are a necessary complement to the transmission lines—almost as necessary to their successful operation as are the fields at one end of them and markets at the other.

So much for the expanding realities of large scale natural gas storage, and the magnitude of its effect both on the gas industry and on the American economy which is our heritage. But the future holds a still greater use for depleted gas fields and their underground storage possibilities. It is not, therefore, in the spirit of prophecy, but only to indicate the way which is clearly ahead of us when I predict that in the not too distant future many of these same natural gas storage pools in the Appalachian area will be used to store manufactured gas, which will be made in the coal fields of West Virginia, Kentucky, Ohio and Pennsylvania, and present pipe line systems, now transporting natural gas, will be used to transport this manufactured gas.

That this may call for a new chemistry of concentrating heat values in more economical volumes of gas than is now commonly practiced in converting coal to gas, I am well aware. But the means and materials are at hand, and the desirability of this new use for underground gas storage may be no further away than around the corner. Surely in this day of postwar planning they cannot be overlooked.

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We are working on War Equipment and Supplying Essential and Emergency Requirements for the Gas Industry.
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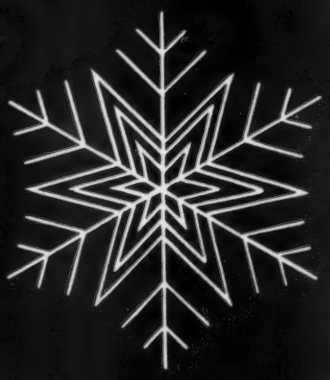
COMPLETE GAS HOLDER INSPECTION SERVICE
40 Years of Sound
STEEL PLATE CONSTRUCTION



Asterisk or Snowflake

IN REFRACTORIES

HOW IMPORTANT IS DESIGN

Design in an asterisk only identifies it. The intricate pattern of a snowflake melts into massed white when it is joined with other flakes. But in refractories design is important and should be functional—serving to fit the refractory to the job. For water gas generators Norton Company has designed a CRYSTOLON (Silicon carbide) brick which withstands severe operating conditions and resists slag penetration making clinker removal a short easy operation. Our engineers have designed a method of installation which guarantees long service from the refractory lining over 23,000 hours of actual gas-making time, for example). We will gladly provide you with additional information without obligation.

NORTON COMPANY — Worcester 6, Mass.

Norton Longer Lasting **Refractories**

NEW PROBLEMS in gas purification have arisen under today's abnormal operating conditions. Unprecedented industrial and domestic demands, shortage of experienced operating personnel, and scarcity of certain materials are contributing factors. That's why more and more gas men today are arranging to "check their purification problems with Connelly."

For over 68 years, Gas Purification has been this company's business. Connelly engineers, working hand in hand with leading technicians of the industry have been able to develop new materials and new methods of using them to meet the changing purification requirements of the industry.

If you have a purification problem, it will pay to consult Connelly . . . today. Our engineering data files, experience, knowledge and laboratory facilities are at your service *without* obligation. Check with the Connelly engineer.

NEW Connelly pH Test Kit

Includes Universal Indicator Solution, test tubes, color chart, and full directions. Complete outfit for easy-to-make and accurate pH determinations. Handy and attractive 3" x 5" pocket case holds entire outfit. Write for details.

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CONNELLY IRON SPONGE & GOVERNOR CO.

CHICAGO, ILLINOIS ☆ ELIZABETH, NEW JERSEY

Underground Gas Storage Proves Its Importance to Southern California Gas Co.

By
Fred A. Herr

EXCEPTIONALLY cool and rainy weather which caused a heavier consumption of gas by domestic users, combined with abnormal demand by war industries, drained Southern California's normal surplus gas supply to such an extent that the most drastic curtailment of industrial gas since 1937 had to be resorted to by the Southern California Gas Co. in December and early January.

With rain in the Southern California lowlands, snow in the encircling mountains, and cold winds keeping the thermometer at unprecedented low levels, the potential load demand for the region serviced by the Southern California Gas Co. exceeded anything ever previously experienced, according to Roy M. Bauer, gas supply supervisor of the company. Government restrictions and limitations of the gas supply, together with the big boost in domestic, commercial and essential industrial usage were complicating factors, it was announced.

Playa del Rey Project

The Southern California Gas Co. succeeded in providing uninterrupted service for all domestic users and critical war operations by utilizing every source of supply, including the huge Playa del Rey underground oil-field gas storage project near Los Angeles, which was available for the first time this winter.

The wisdom of the Playa del Rey underground storage project has been demonstrated by the recent gas shortage. Proposed by the California Railroad Commission early last year, the plan called for the storage of two billion feet of surplus gas in depleted oil wells of the Playa del Rey field, 15 miles from Los Angeles. This, according to the commission's estimate, would in times of shortage permit the withdrawal of from 20 to 25 million cubic feet per day during cold spells, such as the one experienced in December and January. The program calls for underground storage of three billion cubic feet during the summer of 1944, two of which would supplement the supply and the third billion cubic feet to be used for pressure to force the stored gas out of the ground into the mains. This project, while sponsored by the government, is operated by the Southern California Gas Co. on contract that calls for the company to compress the gas into the field and handle its distribution.

A survey made by the State Railroad Commission while consideration of the Playa del Rey storage plan was under way disclosed that the Los Angeles-San Diego area had a normal gas supply of approximately 528 million cu. ft. per 24 hours, while the estimated non-curtailable peak demand for 24 hours was 600 million cu. ft., not including the industrial load of 145,000,000 cu. ft. These figures revealed a potential deficiency of 78 million cu. ft. without counting the industrial load.

In the December-January emergency, Diesel oil gas manufactured in the Southern California Gas Co.'s Colton, Calif., plant and two Los Angeles plants was also drawn upon.

Industries Affected

Industries classed as non-essential were the ones chiefly affected by the curtailment in industrial supply. Of the 125 laundries in Southern California (90 of which are in the Los Angeles metropolitan area), 25% of the smaller companies which were not equipped with fuel oil change over for their boilers were affected by the curtailment. A number of bakeries in Los Angeles also were forced to close down, since they are classed as essential industries only in so far as bread production is concerned.

Approximately 50 industrial plants in the Los Angeles-Long Beach Harbor districts, which includes the cities of Wilmington and San Pedro, had their industrial gas supply shut off; however, since most of them were able to change quickly to oil for heating and fuel, their operations were not seriously interrupted. Chief sufferers in the Harbor District were several cleaning establishments which had to cease operations because their equipment was not convertible to the use of other fuel.

In Visalia, Calif., three laundries and dry cleaning establishments and two bakeries closed down temporarily as a result of the withdrawal of industrial gas by the Southern California Gas Co.

Because of the increased need for gas in the Los Angeles area, seven industrial plants in Bakersfield, Calif., were shut down when their fuel supply was cut off by the Pacific Gas & Electric Co. The plants included the Kern County Dehydration Co., San Joaquin Valley Cotton Oil Mill, three laundries, a dry cleaning establishment and an ice plant. H. K. Knox, Bakersfield district superintendent for the P.G.E.C., announced that the shut-off would remain in effect as long as the increased need for fuel existed in the Los Angeles area.

The Public Notified

A statement issued by the Southern California Gas Co. explained to the public the combination of circumstances which made the curtailment necessary:

"Weather conditions with relatively low temperatures," the statement explained, "have made it necessary for the gas companies to curtail deliveries of surplus gas to industrial customers to meet the heavy demands of essential civilian users and the most critical war operations, as designated by the government.

"Industries for many years have been using surplus natural gas at low rates under contracts which provide that service will be discontinued whenever the gas is needed to supply essential civilian and war industry requirements. During the present cold weather this situation prevails."

A Survey Of Underground Natural Gas Storage Projects in the United States

By the Research and Coordinating Committee of the Interstate Oil Compact Commission

Headquarters, State Capitol Bldg.
Oklahoma City 5, Okla.

At the quarterly meeting of the Interstate Oil Compact Commission, held in Santa Fe, N. M., September 24-25 a survey of underground natural gas storage projects was presented. We feel this survey to be of such special interest due to the current shortage of natural gas, that we are printing the report in full.—Ed.

WITH SHORTAGES of natural gas occurring in critical areas last winter under peak demands, many natural gas companies began investigations of depleted pools for possible storage reservoirs to be utilized this winter.

Underground storage of natural gas is not new to the natural gas industry. The first successful underground storage of natural gas was in Welland County, Canada, in 1915. A second underground storage of natural gas was effected in the Zoar field in Buffalo, New York in 1916. One of the first companies to utilize underground storage was the Central Kentucky Natural Gas Company of Lexington, which stored gas in the Menifee field in Kentucky in 1919.

Underground storage consists of returning gas under high pressure to certain depleted or partially depleted fields, thus restoring the fields to something near their original capacity of production. The field is rehabilitated during off-peak periods, thus allowing the gas to be held in close proximity to the markets to serve peak demands. An example of natural gas conservation is found in the Bow Island field in Alberta, Canada, in which natural gas was stored from production in the nearby Turner Valley Field. In a period of nine years, nearly 12 billion cubic feet of natural gas was pumped into the Bow Island Field.

Storage areas must be carefully selected in order to have a closed reservoir that will not permit leakage. Preliminary steps in choosing reservoir sands require a study of the past production. Fields which have high porosity and permeability, and do not contain water, are particularly desirable.

The use of underground storage has played an important part in the war effort. Tremendous demands, resulting from the war effort, might not have been met in the Appalachian area during the past year and a half if the use of underground storage had not come into common practice in recent years. These demands, particularly, on peak days were so great that it would have been impossible in the past two winters to have supplied all of the essential markets with gas if storage had not been available.

The salvation of the natural gas industry in the East has been the use of underground storage. Conservation has been furthered because it is possible to transfer gas into storage from highly competitive areas where flush production might encourage uneconomical use of the product on account of a need for an immediate market. Underground storage has also been the boon to the small stripper production of many of the Appalachian gas wells which can only be operated economically if they are used 365 days a year, since their daily production has been greatly reduced in recent years. The abandonment of many small wells, which consequent lack of total depletion of the area and the resulting loss of this reserve for any practical use, has been avoided because these wells can now be produced with at least a small profit by using them every day in the year and permitting their production to go into storage in summer periods when there is no demand for the gas.

The Research and Coordinating Committee, in its report made at the 1942 Fall Quarterly meeting at Chicago, recommended the greater use of depleted oil and gas reservoirs for natural gas storage. In its research program the Committee has been seeking information on the usage of underground natural gas storage with the result that information has been obtained regarding many projects. No attempt has been made to obtain all details which may possibly be obtained by interested individuals from the companies.

The Natural Gas Section of the American Gas Association conducted an excellent symposium on underground gas storage at the 1940 annual meeting held in Houston, Texas.

Arkansas

The Southern United Gas Company of Fort Smith is utilizing the Lavaca gas field for underground storage of natural gas. This field, near the town of Lavaca, is located in Sections 21, 22, 27, 28, and 29, Township 8 North, Range 30 West, Sebastian County, about 15 miles east of Fort Smith. The drainage area of the field is about 2,200 acres.

The discovery well of this field was completed in 1928 and no drilling has been done since 1930 when the last well was completed. The original maximum rock pressure in the field was 280 pounds and the total initial open flow of all wells was 70 million cubic feet. The initial open flow of the wells varied from 15 million cubic to 1½ million cubic feet. The field produces from the Atoka (deep) formation of Pennsylvania Age at an average depth of 1,775 feet.

The gas field was produced several years prior to being used as a storage area in April, 1936. During this period a total of 1064 million cubic feet of gas was produced and the average pressure had declined from an original maximum of 280 pounds to an average of 186 pounds. The production per pound loss was 11.3 million cubic feet. The open flow

had likewise declined from 70 million cubic feet to 45 million cubic feet.

With declines in pressure and volume of some of the older fields which formerly served the market from other directions, the Southern United Gas Company was forced to depend more and more upon the productivity of the Lavaca field and other fields to the east. The field is connected to a ten-inch transmission line which extends east about 15 miles to the market. The line also extends west about 30 miles. Gas is gathered along the west line from four additional gas fields whose rock pressures (with one exception) exceed those of the Lavaca field. The one exception is a small field on the west extremity of the line. In this field gas is picked up by a small compressor unit and is discharged at such pressure as may be required for repressuring operations.

To increase deliveries on the east line it was necessary to increase field pressures to afford greater pipe line carrying capacity. As field pressures were increased and more nearly approached the rock pressures of the wells in the repressured area, the deliverability of the wells was materially lessened. Wells east of the Lavaca field, which were farther removed from the market, had sufficient reserve pressures to combat these increased line pressures but insufficient open flow to match the demands of the market. The Lavaca field wells had considerable open flow that could not be utilized against the pressure at which they were required to work. Since additional gas was required only for a few peak hours during the days of the winter season, it was considered unwise to build a compressor station since the necessary hours of operation would be limited to less than 500 hours per year.

This conclusion led to the decision to repressure the Lavaca field during off-peak hours, days, and months, and enabled the building up of a stand-by both in pressure and volume to draw upon only when other sources were inadequate. At present, there are 10 active wells in the field, nine of which are used for repressuring operations. One active well, which is centrally located within the field, has been taken out of service and is used as the informative well from which the pressure readings are obtained.

The repressuring program was favored by the following factors:

1. **All acreage within the drainage area was under lease by the company.**
2. **All productive leases which did not provide for a fixed annual royalty were readily converted to such basis.**
3. **No water difficulties of any kind had been encountered in the development or operation of the field.**
4. **The drainage area of the field was sufficiently small to enable the field to regain pressure rapidly during the peak periods.**
5. **There was sufficient open flow capacity in the field to be effective when needed.**

When repressuring was started, the Company was quite concerned over the fact that the pressure increased one pound for an input of only eight million cubic feet of gas and that withdrawals followed in the same proportion. As the field had produced prior to repressuring an average of 11.3 million cubic feet per pound loss in pressure, it was concluded that the effective reservoir is not as large as originally. There has been no change in the output and input of gas per pound of pressure.

Pressures in the storage reservoir have varied since the start of repressuring from a minimum of 155 pounds to a maximum of 235 pounds with little effect on the amount of gas either stored or withdrawn per pound gain or loss in pressure, indicating that all stored gas is being recovered.

The Southern United Gas Company is well satisfied with this repressuring experience. It is felt that the problem of caring for peak loads without resorting to compression has been solved and that this program can be continued as long as other gas is available at pressures adequate for repressuring.

Much consideration must be given to the selection of a storage area. A small area with a rapid pickup in pressure is desirable for short heavy withdrawals, while a larger area with lower pressures might prove more advantageous if it is desired to digest low pressure distress gas or comply with off peak contractural purchase obligations.

California

With Southern California war industries dependent almost entirely on natural gas for fuel, the variations in seasonal demands for fuel provided stimuli for seeking ways and means of storing gas to provide additional gas during the winter season, thus insuring an adequate supply for the demands of war industries.

In deciding on underground storage near Los Angeles, conservation was an important factor. Little gas is being wasted in California but even some of this waste will be reduced by storing the gas in the summer months when the gas line from the San Joaquin Valley can carry more than the demand.

In 1942, after many fields in the Los Angeles Basin were investigated, the Playa Del Rey field was selected because of its location near the load center of metropolitan Los Angeles, its proximity to a natural gas trunk line, its geological structure, and the near depletion of its producing zone.

The field is located on the shore of the Pacific Ocean about two miles southeast of the beach community of Venice, a part of the city of Los Angeles.

The proved producing area of the portion serving as a reservoir is 310 acres in extent of which approximately one-half is controlled by the Union Oil Company; the other half, a town-lot area, is controlled by about 200 small lease and royalty holders who are scattered over the country. There are 19 producible wells on the Union Oil Company property and 18 on the town-lot area. Approximately one-half of these are now on production.

As some unified control of the field was necessary for successful operation of a gas storage project, an appeal was made to the Federal Government to acquire the property rights. This appeal was made to the Defense Plant Corporation upon recommendation of the California State Railroad Commission, which had made a survey of the project, of the California State Department of Natural Resources, which had cooperated with the Railroad Commission, and of the Office of Price Administration and War Production Board, which made studies of the report submitted by the Railroad Commission. Acting on this appeal, formal possession was taken by the government late in September, 1942, and the first gas was injected on October 12, 1942.

The gas is piped to the field by the Southern California Gas Company and is injected through several wells. The necessary functions, in addition to installation and operation of facilities for injection and withdrawal of gas by the gas company, are performed by the Union Oil Company, named agent for the Defense Plant Corporation, and these functions include everything concerned with the operation and maintenance of wells. The gas company pays for use of the reservoir and makes compensation for deferment of oil production.

The study of the field made by the State Railroad Commission was based on drillers' logs, electrical logs, core records, and other available sub-

surface data. Contour maps were made of the top of the producing zone and of the schist underlying that zone. From these, the thickness of the sand above the water table was determined and an isopach map of the sand thickness for the area was constructed.

There appears to be no actively encroaching edge water in the field. Depletion has been due almost entirely to gas expansion and it is believed that the reservoir sands originally containing oil and gas are still free from encroaching water. The original reservoir pressure at an average mid-point of the reservoir was 2750 lbs. per sq. in. The bottom hole pressures at the beginning of the storage project were as low as 30 pounds per square inch in some places.

By laboratory tests of porosities and permeabilities and other factors, it was calculated that a gas storage of 2 billion cubic feet would be provided by the 20,428 acre-feet of sand estimated as effective for storage.

Gas injection began at the rate of approximately 4,000,000 cubic feet per day. In December, 1942, gas was being injected without compression at line pressures between 125 and 165 pounds per square inch.

Kansas

Two companies are engaged in underground storage operations in Kansas at the present time. The Cities Service Gas Company is operating four projects—North Welda, South Welda, Craig, and Boyer. The first one was started about 1929. The Union Gas System is experimenting in two projects with success.

Testimony at the Federal Power Commission hearing held in Kansas City, Missouri, in August, 1943, revealed some pertinent facts regarding the Cities Service projects.

The maximum pressure in the Welda Storage field when it is full is approximately 280 pounds. The maximum amount of gas drawn out of the North Welda field in any one day was 56,805,000 cubic feet on December 13, 1940, when the field was approximately full. The maximum amount withdrawn from the South Welda Storage in any one day was 54,177,000 cubic feet on December 1, 1942, an early date in the withdrawal season. The maximum amount withdrawn from the Craig Storage field was on December 11, 1941, when 29,811,000 cubic feet were removed. The maximum amount withdrawn from the Boyer Storage field was 8,999,000 cubic feet on November 14, 1940. Each of these dates was early in the withdrawal season when the storage was approximately full.

MAXIMUM WITHDRAWALS FROM STORAGE
WINTER 1940-41, 1941-42, 1942-43
ALSO PEAK DAY WITHDRAWALS—JAN. 7, 1942 AND JAN. 18, 1943

	Million Cubic Feet			
	Boyer	Craig	N. Welda	S. Welda
1940-41				
Quantity	8,999	26,479	56,805	45,545
Date	Nov. 14, 1940	Feb. 20, 1941	Dec. 13, 1940	Dec. 2, 1940
1941-42				
Quantity	8,676	29,811	44,048	50,018
Date	Dec. 12, 1941	Dec. 11, 1941	Nov. 6, 1941	Dec. 11, 1941
1942-43				
Quantity	4,306	19,454	45,811	54,177
Date	Mar. 4, 1943	Jan. 18, 1943	Nov. 29, 1942	Dec. 1, 1942
Jan. 7, 1943	3,396	8,630	22,215	42,337
Jan. 18, 1943	3,035	19,564	31,690	46,360

The maximum capacity of the two gas lines running north out of the Welda Storage field is about 103,000,000 cubic feet per day.

Kentucky

The Central Kentucky Natural Gas Company began using underground gas storage in 1919 when the company adopted the idea of purchasing large quantities of natural gas in the summer months and storing it in the Menifee field. A total of 6,369,642,000 cubic feet of gas was stored up to January 1, 1931 when storage operations were discontinued as the needed gas was obtained from other sources. Up to January, 1940, a total of 4,967,606,000 cubic feet of natural gas was withdrawn from the reservoir.

The Menifee field covers an area of approximately 13,000 acres and is located in Menifee, Montgomery, and Powell Counties. The reservoir is a typical stratigraphic trap, as the producing horizon, the "Corniferous," has been beveled and overlapped by the bituminous black Chattanooga shale. The updip wedging of this formation and the later overlap make the field an ideal reservoir. The field is typical of conditions along the beveled zone for a distance of more than 100 miles in Eastern Kentucky. The Menifee field is the only gas storage reservoir in the eastern part of Kentucky.

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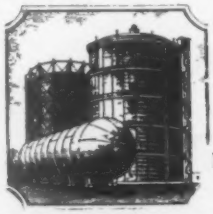

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MENIFEE STORAGE RESERVOIR

Average rock pressure prior to storage year, 1918	28.7 Lbs.
Average rock pressure May 31, 1937	40.0 Lbs.
Gain in rock pressure	11.3 Lbs.
Total natural gas stored 1918—May 31, 1937	1,585,336 MCF
Gas stored per lb. increase in pressure	116,000 MCF
The gas in reservoir other than stored is to zero gauge withdrawal pressure (116,000 MCF x 28.7)	3,329,200 MCF
Total gas content May 31, 1937 (1,585,336 MCF + 3,329,200)	4,914,536 MCF
Menifee County	
Total Acreage	20,604.65
Number of wells	87
Gas Reserve	4,914,536 MCF
Recoverable gas reserve (MCF Estimated @ 2/3)	*3,741,000
Value of gas reserve @ .1366 storage price	$ 447,550
*Stored gas	1,585,336

The Louisville Gas and Electric Company has a small gas storage reservoir about 30 miles from Louisville. This reservoir contains about 350 acres. Approximately 325 million cubic feet of gas can be stored while the field pressure rises from 75 pounds to 125 pounds, and the quantity of gas stored per pound rise of field pressure increases with the field pressure. About 3.2 million cubic feet of input gas raises the pressure from 75 pounds to 76 pounds; 5.3 million cubic feet raises the pressure from 100 pounds to 101 pounds; and 7.8 million input from 125 pounds to 126 pounds.

The storage reservoir is a symmetrical shaped dome with a closure of about 150 feet. The gas was found in the highly porous "Cornif-erous," Louisville, and probably Laurel limestones. The initial gas volumes ranged from 1.2 million to 10 million cubic feet per well. The original pressure was 125 pounds.

New Mexico

The only underground gas storage project in New Mexico, the Keyes Repressuring project located in Township 17 South, Range 28 East, Eddy County, is operated by the Southern Union Gas System of Dallas, Texas.

The 400 acre project with four wells has proven successful. On a peak day last winter a volume of 100 MCF per hour was withdrawn during the peak hours. The gas is obtained from the Lea County Water Company through a pipe line from the Hobbs Field. Compressors are not needed for injection, although a 400 horse power compressor is available for use.

Ohio

The Ohio Fuel Gas Company of Columbus in the latter part of 1935 began investigating the feasibility of underground gas storage as a means of meeting peak winter demands for natural gas. During the investigation it was found that the Clinton sand was suitable for storage purposes. The Clinton Sand was found to have suitable porosity and permeability. In Ohio the Clinton sand is found in irregular lenses and does not contain appreciable amounts of water.

The old Clinton sand area near Crawford Station in Hocking County was one of the first to be investigated. One of the first pools examined in this area contained old wells in which the rock pressure was approaching abandonment—44 pounds—and the lens from which the wells produced was almost entirely encircled by dry holes. Beyond the dry holes were more producing wells having rock pressures of about 200 pounds. In all, three adjacent pools were chosen and the pools were known as the Benton Storage Area. A short time later, another project was begun in Ashland and Richland Counties, known as the Perrysville Area.

The Benton project contains about 10,000 acres. The depth to the Clinton sand averages 2,200 feet and the original rock pressures were 900 pounds when the wells were completed in 1917. When storage began in 1936 the rock pressure averaged about 80 pounds. In December, 1940, the pressure had risen to approximately 575 pounds.

The Perrysville area contains about 11,000 acres and also comprises three pools. The depth to the Clinton Sand is approximately 2,600 feet and the original rock pressures were about 1,200 pounds. At the beginning of storage, the rock pressure was approximately 120 pounds. In December, 1940, the pressure was about 610 pounds. The two storage projects contain 119 storage wells. In December, 1940, the total amount stored was 26 billion cubic feet with the amount in storage about 14 billion cubic feet. It is believed that the projects will hold a minimum of 20 billion cubic feet. The maximum gas storage up to May 1943 was approximately 19,300,000 MCF in November, 1943. The Ohio Fuel Gas Company is making a study of the results of drilling additional wells within the storage areas.

The Manufacturers Light and Heat Co. utilizes the Brinker field in Columbiana County for underground gas storage. This field, a dome type reservoir in the Berea sand, comprises 717 acres with 12 wells. A total of 864,000 MCF of natural gas is in storage. The daily average delivery to storage is 3,000 MCF, and the daily average delivery from storage is 2,500 MCF.

No information is available on the underground gas storage project of the East Ohio Gas Company in Stark and Summit Counties.

Oklahoma

The Oklahoma Natural Gas Company has been very active in the search for suitable reservoirs for natural gas storage. The depletion of important reserves in the vicinity of the Tulsa market forced the transportation of gas over considerable distances in order to supply the demand. One project, the Bixby gas storage reservoir, was put in oper-

KEYES REPRESSURING PROJECT
Eddy County, New Mexico
Summary of Well Data to June 1, 1943

Location	T. E. K. 3A LC 028053 A NE NW Sec.10	T. E. K. 1B LC 028053 B SE SW Sec. 3	T. E. K. 2B LC 028053 B NW NW Sec. 10	Red Gulch No. 1 State 2029 SE SE Sec. 4
Elevation	3,550	3,555	3,529	3,520
Casing Depth	1,275	1,320	1,251	1,244
Casing Size	7"	7"	7"	7"
Cement Record	None	None	None	None
Depth Sand	1,390–1,417'	1,390–1,415'	1,362–87'	1,348–70'
Total Depth	1,417'	1,415'	1,387'	1,370'
Date Completed	1/26/36	5/4/36	9/9/37	1/10/38
Original Open Flow	7,500 MCF	4,000 MCF	2,405 MCF	4,362 MCF
Original Rock Pressure	405 Lbs.	400 Lbs.	315 Lbs.	310 Lbs.
Open Flow Before Repressuring	3,260 MCF	277 MCF	322 MCF	1,680 MCF
Rock Pressure Before Repressuring	204 Lbs.	223 Lbs.	208 Lbs.	237 Lbs.
Total Withdrawals through May 1943	354,872 MCF	308,269 MCF	62,390 MCF	197,528 MCF
Rock Pressure May 25, 1943	375 Lbs.	290 Lbs.	376 Lbs.	237 Lbs.
Total Input through May 1943	217,490 MCF	None	None	None
Date Injection Started	7/16/42			

ation in 1937. This reservoir, involving about 300 acres, 25 miles from Tulsa, was unprofitable and finally abandoned.

The Oklahoma Natural Gas Company is now developing a new project in Osage County, utilizing the Burgess sand as the storage horizon, in Township 20 North, Range 12 East. The Burgess sand, found at a depth of about 1,600 feet, had been produced to an abandonment pressure of 13 pounds per square inch a number of years ago.

Storage of gas in the reservoir was begun about April 24, 1943, and the total gas put in storage up to August 22, 1943, was 723,747 MCF and it is anticipated that one billion cubic feet of gas will be in storage by November, 1943. The formation pressure has risen from 13 pounds to about 150 pounds. The storage reservoir, which is expected to have a delivery capacity of about 25,000 MCF per day, will be used only during peak demands on Tulsa or during emergencies resulting from pipe line failures.

Some difficulty has been encountered in leakage from the storage reservoir through some oil wells which are producing from the Wilcox Sand below the Burgess. However, arrangements are now being made to remedy this situation.

The Northern Oklahoma Gas Company of Ponca City has been surveying the possibilities of gas storage in old depleted pools in the vicinity of Ponca City. At this time two pools have been found with indications of sufficient closure for gas storage. One of the areas, north and west of Ponca City, was drilled in the early 1920's. A study is being made of the plugging of the wells to prevent any possible leakage. The other area, immediately north of Ponca City, covers a larger area. This field was drilled and produced between 1908 and 1913 and no production records exist. It is hoped that these areas will justify the expense of pipe laying and the installation of compressor equipment.

In the Oklahoma City field the Phillips Petroleum Company is utilizing their Sullivan No. 1 well for underground storage of gas. This well, a former oil producer plugged back to the Layton sand, receives excess gas from the nearby Phillips natural gasoline plant. When the surface pressure is 500 pounds, it is estimated that 225,000,000 cubic feet of gas is in storage. The well is used as a reserve storage of gas, especially in mornings, as a short peak load at a rate of 2 to 3 million cubic feet can be obtained for 4 or 5 hours and the pressure can be reduced down to 220 pounds. It is understood that the Phillips Petroleum Company is experimenting with the underground storage of butane in the Oklahoma City field.

The Cities Service Gas Company has used the Layton Sand intermittently since 1930 for underground natural gas storage in the south end of the Oklahoma City field. The input wells have been the Oklahoma City No. 1 discovery well of the field, the A. Bodine No. 1, and the R. Jennings No. 1. Gas has also been put back on an experimental basis in the A. Bodine No. 7, which is a Prue sand well. The maximum pressure when injection was stopped about a year ago was 350 pounds.

The Southwest Natural Gas Company of Ada, Oklahoma has since 1928 used a depleted natural gas field north of the City of Ada, for underground storage. This storage, although somewhat limited by the encroachment of water, has proved very important in meeting peak demands of the Company's system and as a stand-by for emergency service in case of line breaks.

The sand is a Basal-Pennsylvanian Sand, 20 to 25 feet thick. For the last four or five years, due to decline in production of gas in the older fields, this field has not been pressured to above 250 pounds. Its deliverability at the present pressure is around 4 million cubic feet for 24 hours. The maximum deliverability has been 10 million cubic feet.

At the present time, 2 or 3 wells are being used as input wells and 4 to 6 wells as producing wells.

Pennsylvania

Natural gas operators in Pennsylvania have been utilizing the benefits of underground storage to a great degree. It is estimated that there are at least 20 underground storage areas in use in Pennsylvania, and at least 5 more areas which are being conditioned for storage during the present year and which will probably be in use this coming winter.

The Peoples Natural Gas Company started storage operations on May 1, 1937 in the nearly depleted Oakford Pool in Westmoreland County. Storage operations were instituted to conserve some of the large quantities of gas from the Northern Oriskany gas fields which were highly competitive. On August 7, 1939 the Murrysville pool in Allegheny County was selected for underground storage, as it was strategically located near large centers of distribution and the gas could be quickly

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The East McKeesport pool in Allegheny County is another storage pool operated by the Peoples Natural Gas Company. During the summer of 1943 the Peoples Natural Gas Company was engaged in reconditioning two other pools for storage. These two pools are of the high deliverability type which are most useful for heavy peak days, as it is possible to store approximately one billion feet at a high pressure and to obtain a high daily deliverability from 15 to 30 million cubic feet per day.

The New York State Natural Gas Corporation has an excellent storage pool in the East End Tioga pool in Tioga County. The gas is stored in the Oriskany sand.

The Manufacturers Light and Heat Company of Pittsburgh has four storage fields in southwestern Pennsylvania. The Majorsville field extends from Washington and Greene Counties in Pennsylvania to Marshall County in West Virginia.

The North Penn Gas Company in November, 1937, started using the Farmington field, the discovery Oriskany gas field, in Tioga County for underground gas storage. Operations were successful during the first two years of operation, but information is not available on present operations.

Texas

The Lone Star Gas Company formerly operated gas storage projects in the Cheaney field in Eastland County and Petrolia field in Clay County, but no gas has been stored in the Cheaney field since 1928 and the Petrolia field since 1941.

STORAGE POOLS
The Peoples Natural Gas Company

	Murrysville	East McKeesport	Oakford	East End Tioga*
Location Township & County	Plum Township Allegheny City	No. Versailles & Versailles Twps. Allegheny County	Penn, Salem & Hempfield Twps. Westmoreland Cty.	Lawrence & Farmington Twps. Tioga County
Size (Acres)	536.65	435.6	6331.88	2766.32
Type of Reservoir (Sand)	100'	100'	Multiple	Oriskany
Capacity at 500 Lbs. (MCF)	950,000	1,564,959	55,000,000	3,694,562
Highest Daily Deliverability to Date (MCF)	16,487 1/8/42	13,074 7/14/42	3,652 10/17/42	17,467 2/15/43
Highest Amt. of Gas Stored Daily to Date (MCF)	2,756 7/21/40	10,773 6/7/42	8,889 3/25/38	10,493 8/1/41

*New York State Natural Gas Corporation.

Manufacturers Light and Heat and Associate Companies

	Cross Creek	Majorsville	Donegal	McKinley
Location Township County State	Cross Creek Twp., Washington Cty., Pennsylvania Jefferson Twp., Washington Cty., Pennsylvania	West Finley Twp., Washington Cty., Pennsylvania Richhill Twp., Greene County, Pennsylvania Sand Hill Twp., Webster Twp., Marshall County West Virginia	Donegal Twp., Washington Cty., Pennsylvania	Highland Twp., Elk County, Pennsylvania
No. of acres	1,911	4,035	2,213	1,050
No. of wells	17	35	15	21
Type of Reservoir	Sand Trap 100 foot sand	Sand Trap Several Sands	Sand Trap Gordon Sand	Dome Kane Sand
MCF in storage	892,000	3,370,000	1,563,000	772,000
MCF average daily delivery to storage	2,500	20,000	8,500	3,500
MCF average daily delivery from storage	1,250	10,000	10,000	1,300

Acknowledgment

The valuable assistance of Miss Honoria Moomaw, Secretary, Natural Gas Section, American Gas Association; F. H. Finn, Chief Geologist, Peoples Natural Gas Company; E. O. Schillhahn, Geologist, Manufacturers Light and Heat Company; W. E. Ferguson, Assistant Manager, Production Division, Ohio Fuel Gas Company; R. E. Stouder, Geologist, Louisville Gas and Electric Company; T. J. Tonkin, Jr., Vice-President, Central Kentucky Natural Gas Company; E. J. McConnell, Chief Engineer, Oklahoma Natural Gas Company; L. A. Farmer, President, Northern Oklahoma Gas Company; L. T. Potter, Superintendent of Production, Lone Star Gas Company; Van Thompson, Southern Union Gas Company; E. F. McNaughton, Director, Public Utilities Department, Railroad Commission of the State of California; S. R. Walker, Vice-President, and A. B. Harper, Southern United Gas Company; Richard McEntire, Attorney, Kansas Corporation Commission; Vernon F. Palmer, Manager, Pipe Lines, Union Gas System, Inc.; W. A. Delaney, independent operator, Ada, Oklahoma; and individuals and companies in conducting this survey is gratefully acknowledged and appreciated by the Research and Coordinating Committee.

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Industrial Fuel Consumption Efficiency in Wartime Britain

By

Ernest A. Dench

BRITISH INDUSTRY is, under war pressure, practicing fuel conservation in a determined, serious and analytical way.

Coal was, until the present international conflict, cheap and plentiful. The same conditions applied to labor, even engineers and other skilled men. Naturally, the widespread adoption of fuel efficiency methods lacked an incentive. True enough, some but not much research was going on all the time by both governmental and non-profit private agencies. With a few outstanding exceptions.

Radical changes in fuel consumption and utilization methods had to combat the traditional ones—and in a tradition-conscious country like Britain, tradition ruled the roost. "When the shoe pinched," as it started to do in September, 1939, the easy-going "what was good enough for my father is good enough for me" attitude of British industrialists changed with painful slowness.

Despite the obvious urgency of mechanized warfare, the ably-conducted educational campaign of the British Ministry of Fuel and Power met with stiff resistance at first.

Coal consumption leaped ahead of coal production due to the abnormal demands of wartime. The production side of coal, with its many headaches to colliery owners, miners, trade union locals, railroads and governmental agencies, is another story. This story is confined to British industry stretching fuel so that the maximum in heat or power utilization is obtained from it.

Fuel Values

The basic essential of any educational campaign, be it the saving of food or fuel, is to aim at a target. This is a powerful incentive to *act* by those the campaign reaches. Industrial fuel users were given an objective when the British Ministry of Fuel and Power issued the following comparison analysis of the four leading fuels:

1 ton of coal or coke	**280 therms**
1 ton of oil	**400 therms**
1000 cubic. ft. of gas	**5 therms**
1000 k.w.h. (electricity)	**34 therms**

Here are the calorific values on which the above figures were based.

Coal and coke	**12,500 B.T.U. per lb.**
Gas	**500 B.T.U. per cubic ft.**
Oil	**18,000 B.T.U. per lb.**

The above target was too technical to expect domestic consumers to understand it. Fuel was "broken-down" into simple portions for the purpose of comparison. Householders could readily keep within their allotted number of fuel units, based on the number of rooms in the house, by remembering that 1 unit meant either 56 lbs. of coal or coke, or 500 cubic ft. of gas, or 50 units of electricity, or 1 gallon of kerosene.

At present there is no known British laboratory test to determine which type of coal is best for a specific heating or power purpose. The most the chemist can do is to distinguish between high and low grade coals. Industrialists are being obliged to use more of the high low grade coals and less of the high grade coals. Even so, the British Ministry of Fuel and Power is not controlling fuel purchases on a uniform nation-wide basis. Fuel production and distribution vary in different parts of Britain, so any changes in fuel purchases by industrialists have to receive official sanction. This helps to balance the regional production or distribution of fuel. One exception to this rule is creosote pitch, an officially approved substitute for the imported fuel oil. Britain has an abundant supply of creosote pitch, a by-product of coal and coal gas, and normally used to preserve railroad ties, telegraph poles, fences and the like.

Fuel Control and Efficiency

The Ministry's experience with human nature is that all established fuels—coal, coke, gas, oil and electricity—must be controlled in any fuel saving campaign, as otherwise some consumers will simply switch from one to another, thus increasing the wartime load in one direction, and reducing it in another.

The Ministry has also discovered that *how* heat and power equipment is chosen, installed or used increases or decreases the fuel consumption. Inefficient utilization wastes the nation's fuel reserves. The Ministry now has power to order changes in the existing equipment or operation methods, but it prefers not to wield the big stick except as a last resource.

An effective way in which the Ministry is spreading the "gospel" of fuel efficiency: At colleges and universities in some sixty industrial centers, fuel efficiency courses are given. The course takes from 10 to 12 weeks to complete. The graduates are employed by the Ministry as either fuel efficiency officers or boiler firemen. Last winter there were over 9,000 enrollments. The services of these trained consultants are available without cost to regional industrialists. "But fuel efficiency," reasons the Ministry with the industrialist who hesitates to change his ways, "is more than a matter of receiving an occasional visit from one of our experts. It calls for eternal vigilance—possible only by employing your own fuel watcher in your factory during the entire working week. What you save in fuel may pay his wage, while production may even improve." Over 20,000 of these privately-employed fuel watchers is testimony to the success of the Ministry's logical line of reasoning.

Industry Cooperates

The Ministry has received unexpected support from key men in principal industries, and also from trade association executives, in the formation of regional fuel efficiency committees. These men stir the backward members of the industry to action, by a tactful selling of a "fuel contribution to the common cause of winning the war." Sometimes it is the factory engineer who is set in his ways rather than the owner. He can, too, be appealed to on patriotic grounds, but there may be, in addition, professional pride or jealousy to

resent outside suggestions. An older member, perhaps also an engineer, of the committee will give him a heart-to-heart talk about "governmental research finding out things about heating which we engineers don't have the time and resources for."

During the first year of this regional committee plan, nearly 2,000 industrial plants, consuming about 8,000,000 tons of coal altogether, were visited. These committees emphasized heat and power operation and maintenance efficiency with *existing* equipment. Only in obviously urgent cases, with the apparatus beyond repair, did they advise new equipment, for which a high priority rating had to be obtained.

There was the case reported by one committee member, a retired engineer, of a factory which found it impossible to decrease fuel consumption without a corresponding decrease in output. He ascertained that eight tons of coal weekly could be saved by discontinuing one of the two watertube boilers in use. Why it had not been done before was because the factory fireman found it easier to care for two watertube boilers than one!

A common practice uncovered by these regional fuel efficiency committees, was the tendency of industrialists to be content with an annual visit from a boiler inspector. These industrialists based their day-in-and-day-out operations on an inspection made *one* day out of 365. Boiler operation should be charted from day to day over several years so that any ailments or other conditions can be remedied from past experience.

Replacements

Another important matter to come to light, was that of those industrialists who either blindly or stubbornly believe that once a furnace is installed for the desired heating capacity, all replacements must be of the same size or design. With the advancement in fuel technology, there may be another type of size of furnace which will deliver a better performance.

Fuel economies in some of the plants visited could have been started at earlier dates, by reducing size of the fire box, or by improving the damper control. The recommendations went into effect.

Low Grade Coal

Some of the committee technicians had, in their own plants, experimented extensively with low-grade coal. They found that, with proper

(Concluded on page 54)

One thing looks the same through every pair

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Estate's postwar planning—both as to products and merchandising policies—is well on the way. When the word comes to switch from war work to peacetime production . . . Estate . . . and Estate dealers will be ready to start . . . *out in front.*

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By

W. F. Schaphorst, M.E.

Newark, N. J.

How to Compute Steam Flow Through A Pipe Without A Steam Flow Meter

It is not always necessary or economical to use an expensive steam flow meter for determining the weight of steam flowing through a given pipe. Nor is it necessary to use orifices and elaborate testing equipment. Nor is it necessary to condense the steam and weigh the condensate, or to watch the boiler gage glass and to attempt to roughly compute steam flow in that manner as is sometimes done in spite of the usual inaccuracy of this latter method. Steam flow can be determined by the simple application of Babcock's well known steam flow formula. The result will not always be 100 per cent accurate, to be sure, but in many instances it will be sufficiently accurate for an approximate test and may lead to a decision to make an accurate test later or to install a steam flow meter.

For example a purchaser of steam wishes to know the weight of steam that is passing through a certain pipe line to one of his steam using appliances or departments. He has thought of buying and installing a steam flow meter but hesitates on account of the cost and is doubtful as to whether or not such an expenditure might prove to be worthwhile.

In a case of this kind the application of Babcock's formula may solve the problem nicely. All that is necessary is to select a straight run of pipe and tap two ordinary but accurate pressure gages into the pipe a known distance apart. The farther apart the better. Then, knowing the exact internal diameter of the pipe and the simultaneous pressure gage readings of the two gages the determination of steam flow becomes a mere matter of applying Babcock's formula which is:

$$w = 87\sqrt{\frac{p\ D\ d^5}{\left(1 + \frac{3.6}{d}\right) L}}$$

where w = the weight of steam flowing through the pipe in pounds per minute;

D = the density of the steam or weight in pounds of one cubic foot of steam at the mean average between the two gages;

p = the difference in pressure between the two gages in pounds per square inch;

d = the accurate internal diameter of the pipe in inches;

L = the distance between the two pressure gages in feet.

Take for example an instance where the pressure gages are placed on a one-inch pipe, 100 feet apart. One registers 5 pounds and the other 15 pounds pressure. How many pounds of steam are flowing through the pipe per minute?

The formula above tells us that to solve the problem we must know the pressure difference p, which is:

15 lb. — 5 lb. = 10 pounds.

To find D the "average" steam pressure must first be determined. In this example the average is:

(15 + 5) ÷ 2 = 10 pounds.

Now refer to your steam tables and you will find that at 10 pounds gage pressure the weight of one cubic foot of steam is 0.0606 pounds; and that is the figure we use in the formula.

Next it is necessary to know the internal diameter of the one-inch pipe. The best way is to measure, of course, but in this problem we will be satisfied with the internal diameter as given in handbooks for standard pipe, or, 1.049 inches.

We now have all of the necessary factors. Substituting them in the formula we get as below.

Work that out and it will be found that the answer is 3.62 pounds of steam per minute.

$$w = 87\sqrt{\frac{10 \times .0606 \times 1.049 \times 1.049 \times 1.049 \times 1.049 \times 1.049}{\left(1 + \frac{3.6}{1.049}\right) \times 100}}$$

How to Bolt A Modern Gage Glass

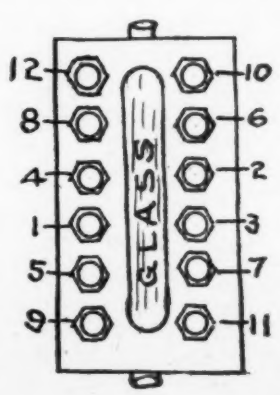
This diagram shows the writer's "system" for tightening the bolts on modern gage glasses of the type that are being used more and more these days. The method is such that the pressure exerted by the bolts becomes equally distributed gradually, with the least danger of possibility of cracking the glass. The thing to do is to begin at the center and work outward as shown by the numbers on the sketch. In other words, start with 1, and then apply the following routine or "system" repeatedly:

Diagonally upward; then straight down;

Diagonally upward; then straight down;

Diagonally upward; then straight down;

And so forth. Get the idea?



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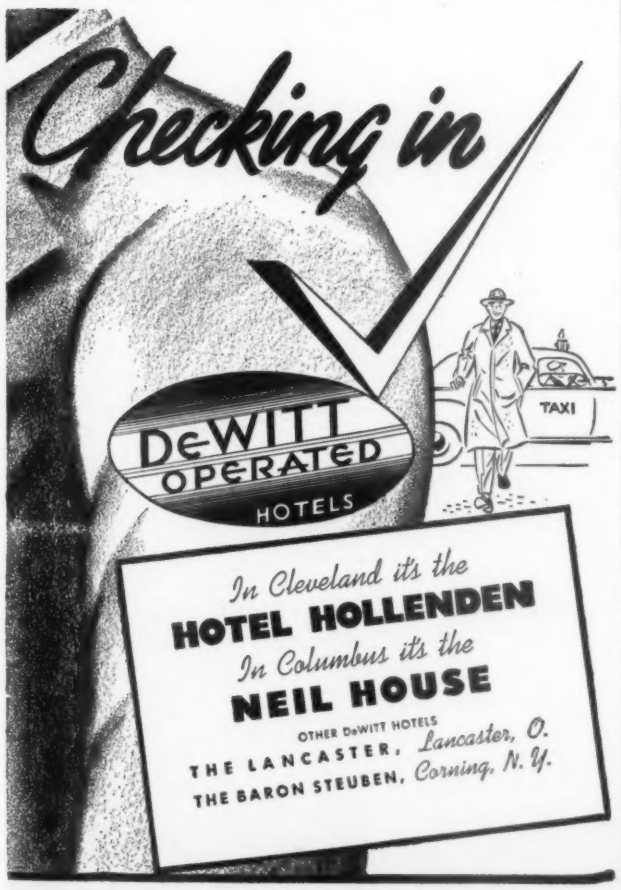

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As the JOURNAL Sees It

IN THE FORMULATION of plans for the resumption of normal activities when the war shall have come to a close, the gas companies can not afford to overlook any avenue that promises to offer potentialities of their fuel. War demands have greatly increased the production of both manufactured and natural gas, and it is not to be expected that this increased load can be maintained unless every possible outlet is developed to the utmost. Our first consideration, of course, must be the domestic load, for this is vital to the future of our industry, our bread and butter, so to speak.

One of the great potential fields for gas after the war, in the opinion of the JOURNAL will be air conditioning, which in recent years has assumed the stature of a major industry, and appears destined to enjoy extraordinary expansion with the return of peace.

In common with almost every division of national enterprise, air conditioning has expanded greatly since Pearl Harbor, and has contributed to the war effort in a large way. It is not to exaggerate to state that the great productive achievements that have brought ever nearer the day of armistice, would not have been possible without this relatively new factor in our economic life. Especially has air conditioning been important in providing comfort for the millions of workers in the factories and plants of the country, and in improving production methods and the products themselves through controlled temperatures, especially important where precision is required, and where the maintenance of controlled temperatures is desirable.

Air conditioning has been important in many other ways, especially in hospitals, operating rooms and administration buildings of the far-flung encampments, the ships at sea, and in air hangars, everywhere, in fact, where controlled temperatures and humidity and the absolute cleanliness of the atmosphere are a factor of importance.

This is a science that is exclusively the child of American ingenuity, and while other countries, notably Great Britain, have adopted it to a degree, it is here that it has enjoyed its greatest growth and development. It is not new, having been first introduced in an experimental way in 1897. However, for modern purposes it may be said to date from 1911 with the introduction by Willis H. Carrier, the father of the industry, of his dew-point control air-washer, which, through bringing the air to saturation, automatically controlled its temperature and moisture content.

Until the early 1920's air-conditioning, like any new innovation, made relatively slow progress, but from then on it grew apace, especially in installations for moving picture houses, theatres, hotels, and restaurants. Indeed, up to 1937 more than 25 per cent of all air conditioning was confined to theaters and moving picture houses. However, from that time until war and its restrictions came air conditioning became more general, both from the residential and industrial standpoints.

It is in the residential sphere that the gas industry will find its great opportunity after the return of normal conditions, for it is only in sections where large supplies of cheap natural gas are available that this industry will be able to profit most under existing conditions, from the industrial air conditioning load. In low-cost natural gas areas, no doubt, there will be a great future for equipment using gas-fired boilers, or direct-power gas-fired engines, or gas-fired motors.

One has to hold no brief for gas to say that our fuel has certain distinct advantages in the field of air conditioning, such, for example, as greater flexibility, easier control, lower maintenance costs, and increased dependability. Every one in this new industry is convinced that gas is the cleanest, most effective, and most easily handled of all fuels.

We all know gas is coming to the fore in the residential field through air conditioning although this load is comparatively new. In addition to the appliance manufacturers who have already introduced air-conditioning units, and the Servel combined heating and air conditioning unit recently announced, a number of others are contemplating the post-war production of such equipment. It has been shown that the gas-fired unit has equal advantages with others available, and that they comply with all national regulations as to safety and durability. Also, operational costs appear to approximate those using competitive fuels.

As we have already said, air-conditioning is a sales outlet for gas that the utility cannot afford to disregard. Its potentialities are enormous, especially in the consumer field. We cannot illustrate these opportunities in a more graphic or responsible way than to quote some of the figures from the report of the Committee on Post War Construction Markets, issued by the F. W. Dodge Corporation.

In the decade 1930-39, according to this report, construction contract volume in the United States averaged $2,595,000,000 a year, of which residential construction accounted for $719,000,000. In the post war decade The Dodge Corporation foresees an annual volume of $5,157,000,000, an increase of 99 per cent. This is a most respectable increase, but by no means as great as the expected increase in residential construction, which is estimated by this authority at exactly 200 per cent or twice that of the total of all construction. The report estimated that there will be an annual demand for 820,000 residential units in the post-war decade.

S. S. Krake

Publisher

RECENT COURT DECISIONS
Affecting Gas Utilities

Validity of Gas Equipment Sale Contracts

By
Leo T. Parker
Attorney at Law
Cincinnati, Ohio

APPROXIMATELY ninety per cent of all litigations involving sale contracts arise from misunderstanding or incorrect information of elementary and simple principles of the law. Obviously, undependable and unauthentic legal information, based upon old and reversed higher court decisions, is likely to result in expensive and unnecessary litigation. Therefore, to acquire dependable legal knowledge it is advisable that gas company officials become familiar with modern leading higher court decisions. It is true that the modern law is full of peculiarities, and we shall in this article review unusually interesting and informative late decisions having special interest to gas company officials, salesmen, and other employes.

Validity of Mechanic's Lien

Almost all contracts for sale of gas equipment and accessories are on installment plan of payment. Therefore, the importance of securing legal rights to mechanics' liens on real property to guarantee prompt payment is readily apparent.

First, it is important to know that if the thing sold is personal property no mechanics lien is available on the property. Furthermore, all liens, or other incumbrances, on real property properly recorded prior to installation of equipment are superior to the mechanics lien.

A recent higher court decision expresses several important points of modern law on these subjects. Therefore, we shall review this litigation in detail.

For illustration, in Mississippi Butane Gas System Company, Inc., v. Glissons, 10 So. (2d) 358, reported January, 1943, it was shown that a gas company sued a man, named Glissons, as maker of a monthly installment payment note given it for the purchase price of a butane gas heating and cooking plant, pursuant to a contract for the purchase of such plant. The gas company asked for a personal judgment against the maker of the note, and for a mechanic's and materialman's lien on the gas plant and the house in which the system was installed and the lot on which the home was situated.

During the trial several important points were proven, as follows: Glissons was occupant and temporary owner of the house and lot, but a party, named Everett was beneficiary and trustee respectively in a deed of trust on the house and lot recorded *prior* to the purchase of the heating plant. The original contract between the gas company and Glissons specified that the gas company retained title in the gas plant as security for the purchase price thereof. This contract also provides that "the equipment covered thereby shall remain personal property."

In consideration of these facts the higher court held that the gas company had no mechanic's lien of the real property and said:

"We hold that under this contract the seller waived whatever lien on the building and lot he might have had otherwise. If it be said the seller, by has action to impress and enforce a lien on the building, has maived the provision, the answer is that he has no right to waive it without the consent of the owners of the realty. . . . The prior trust deed on the house was on record and appellant (gas company) had constructive notice thereof."

On the other hand, an important point of this higher court decision is that under the identical circumstances the gas company may have been awarded a mechanic's lien if the testimony had proven that the installation of the plant was necessary to reasonable use and enjoyment of the property by the occupant. In this respect the court said:

"Nor is it shown that the installation of this system was necessary to the enjoyment or use or preservation of this residence. The lower court was correct in holding appellant had no lien on the building and lot and that Everett's trust deed was a first lien thereon."

Notwithstanding the fact that the higher court refused to hold the gas company entitled to a lien on the real property to secure payment for the heating plant the higher court rendered a judgment against Glissons for the full contract price of the heating system. Whether this judgment ultimately proves of value depends upon the personal estate of Glissons. In other words, if Glissons has no real or personal property which the gas company may attach and sell to secure the contract price of the heating plant it is improbable that the company will receive any payment for the system which it installed in the house occupied by Glissons and on which Everett held a recorded deed of trust.

Glissons endeavored to avoid a personal judgment against himself by testifying that he had signed an agreement that contained a clause to the effect that if Glissons were not satisfied the gas company would retake the system in full satisfaction of the debt. Also, Glissons testified that the salesman verbally agreed that if Glissons was not satisfied with the system, after use thereof for thirty days, the gas company would retake it in full satisfaction of the debt. However, the higher court refused to consider this agreement as valid because authorized gas company officials had not signed the agreement. This court said:

"The writing was not an agreement. It was merely a consent, signed by Glissons for the gas company to enter the premises and retake the gas system, if it cared to do so, without being guilty of trespass. . . . The alleged oral agreement by the salesman, made when the

order was taken, was affirmative matter which should have been set up by special notice. The peremptory instruction as to the gas company against Glissons should have been granted to the extent of a personal judgment against him for the principal of the note and interest and $75 attorney's fees."

Conditional Contract Law

It is well known that either a properly recorded conditional contract of sale or a chattel mortgage gives the seller a first lien on the subject of the sale. Neither a conditional contract of sale nor a chattel mortgage is valid, with respect to innocent parties, unless it is properly and legally recorded.

A conditional contract of sale or a chattel mortgage recorded in *any* county in *any* state in the United States is valid with respect to *all* persons in the whole United States. This rather unusual law may, at first hand, appear impractical and unreasonable, because no seller can search the records in every county in every state in the United States to ascertain whether another seller has a first lien on merchandise. However, this law originally was designed to protect sellers who are legally required to record conditional contracts of sale and chattel mortgages *only* in the county where the sale was made or in some instances where the merchandise may be in stalled. See, Conway, 41 Pac. (2d) 1049.

Whether a gas company has a valid lien on real property to secure payment of permanently installed equipment depends, therefore, whether another lien, as a mortgage, is recorded against the real property. Of course, neither a contract nor mortgage is valid and effective unless properly recorded, or brought to attention of the other party.

For illustration, in Williamsburg, 190 F. 871, it was shown that the seller of an installed system had not recorded his contract. The court held that as between such seller and a subsequent innocent mortgagee of the building in which the system was installed, the system became a fixture and the lien of the mortgage on the building was superior to that of the seller.

Also, see Phillips-Michigan Company v. Field Corporation, 221 Mich. 17. In this case the contract retained title to the equipment and stipulating it should not become a fixture but would remain personal property. The contract also provided:

"But the said first party (seller) if it so elect, may at any time declare said system to be the property of the said second party (purchaser) and avail itself of any lien or supply law or other remedy."

Naturally the institution of the suit to enforce a mechanic's lien on the building was an election under the foregoing quoted provision.

Therefore, in determining whether personal property attached to realty becomes a fixture and a part of the realty the intention of the parties is of paramount importance. See, Love v. Union Central Life Ins. Co., 168 Miss. 408; 22 Am. Jur. p. 718-6 and the authorities in note.

Positive Fixture Law

Sellers of equipment, under conditional contracts of sale or chattel mortgages, should be very careful that the equipment is not attached to a building in a manner that its removal will damage the building. Such equipment is personal property.

For example, *if a legal fixture* is sold to a purchaser who owns a building and the holder of a mortgage forecloses on the building, the new occupant of the building can prevent the seller from removing and repossessing the equipment. Of course, if the equipment is attached to the building in such a manner that the removal will not effect damage to the building this rule of law is not applicable.

For example, in Supply Company, v. Kaybe, 24 Atl. (2d) 570, it was shown that a seller sold, under a conditional contract of sale, certain equipment to a lessee of a theatre building. When the seller attempted to repossess the equipment the owner of the building objected on the grounds that the equipment was a legal fixture and could not be removed from his building. However, the higher court held in favor of the seller repossessing the equipment, and said:

"The trial judge must have found that the chattels in question were not so affixed to realty as to become part thereof."

Members of Military Service

It is most generally believed by the average layman that neither a conditional contract of sale nor a chattel mortgage may be foreclosed against a person serving in the Military Forces of the United States. However, a late higher court held that this law is not applicable where the conditional contract or the mortgage was signed after the Soldiers' and Sailors' Relief Act was enacted on October 17, 1940.

For example, in Price v. Phillips, 12 So. (2d) 59, reported March, 1943, it was shown that a purchaser executed a contract, notes and chattel mortgage on December 15, 1941. In January, 1942, the purchaser joined the United States Army. In March, 1942, the agreed payments were not made and the seller, or holder of the chattel mortgage, filed a foreclosure suit.

It was contended by the counsel for the purchaser that the suit was invalid because of the above mentioned Soldiers' and Sailors' Relief Act. However, it is interesting to observe that the higher court held this law not applicable, and that the suit was valid. This court said:

"In the first place, under the terms of Section 302 of the Soldiers' and Sailors' Civil Relief Act, approval October 17, 1940, 50 U. S. C. A. it is provided that the provisions of the section relating to the stay of foreclosure proceedings under a mortgage on real or personal property only applies to obligations originating prior to the approval of the act."

Notwithstanding the importance of this decision it is doubtful that all future courts will render decisions to the same legal effect.

Law of Delivery

Modern higher courts hold that failure of a gas company to deliver merchandise on the date positively promised entitles the purchaser to rescind the contract. However, if the date of delivery is *not absolutely* positive the sale contract is valid if the seller makes delivery *within a reasonable time* after the sale contract is made.

For example, in Mullen v. Hibbert, 33 Atl. (2d) 435, reported August, 1943, the testimony disclosed that a salesman took an order or contract for electrical and gas equipment and promised delivery 'if at all possible" the next day, Thursday. The purchaser gave her check for $100 part payment. When the equipment did not arrive on Thursday afternoon or Friday morning she called her bank and, ascertaining that the check had not been cashed, stopped payment thereon. She purchased the equipment from another seller. The original seller delivered the equipment Friday afternoon, but the purchaser refused to accept delivery explaining that she had made another purchase. The original seller filed suit and the lower court held the purchaser bound to accept and pay for the equipment. The higher court upheld this verdict and explained that since the seller had not positively promised delivery on Thursday, delivery on the following day resulted in completion of a valid contract. This court said:

"No definite time was agreed upon for delivery and the only agreement was that all possible speed would be

used to accomplish its delivery. Where by a contract to sell or a sale the seller is bound to send the goods to the buyer, but no time for sending them is fixed, the seller is bound to send them within a reasonable time."

Still another important point of law decided by a modern higher court is that where the contract provides that the buyer is allowed a specified time in which to discover defects, the purchaser forfeits his legal rights if he fails to comply with the details of this agreement.

For example, in De Witt v. Itasca-Mantrap Co.-Op. Electrical Ass'n., 10 N. W. (2d) 715, reported September, 1943, it was shown that a clause in a contract required the purchaser to inspect the merchandise at delivery point, and that the purchaser "may reject" defective material before incorporation thereof into its system.

It is interesting to observe that the higher court indicated that under a contract of this nature a purchaser becomes obligated to pay for all merchandise which he accepted and used, irrespective of the fact that the seller incorrectly marks or labels the merchandise. This court said:

"Where, under a contract of purchase, the vendees are allowed a specified time in which to discover defects, it is not . . . proper for the court . . . to treat the contract as allowing the vendees an indefinite period in which to discover and complain of such defects. The above is true though the vendees alleged that the sellers had perpetrated a fraud upon them by falsely representing the qualities of the property sold."

When Seller May Waive Rights

Modern higher courts hold that either sellers or purchasers may waive their rights by including clauses of this nature in the contract.

For example, in Monarch Company v. Meyer Company, 130 F. (2d) 582, it was shown that the company contracted to purchase certain machinery. The seller guaranteed to replace defective parts, but the contract contained a clause exempting the seller from liability for any and all delays, damage or consequential damage in shipment, erection or operation of the machinery.

When the machinery failed to operate satisfactorily the purchaser complained. The seller attempted to repair the machinery, but the purchaser still was dissatisfied and a suit was filed. The purchaser asked the court to compel the seller to take back the machinery and refund the contract price.

However, it is important to know that the higher court refused to do so and held that when the purchaser signed the contract containing the above mentioned clause the purchaser became obligated to accept the machinery, keep it and pay for the same, irrespective of the fact that the purchaser was dissatisfied.

Steinberger Opens Office in Dallas

E. A. Steinberger, chief valuation and plant accounting engineer for Lone Star Gas Company, has announced his resignation to enter private practice as consulting valuation accountant and engineer. He plans to open his office in Suite 1308, Liberty Bank Building, Dallas.

Mr. Steinberger will specialize in all phases of valuation accounting and engineering of gas and oil properties, a field in which he has had approximately 20 years of practical experience, as well as in the derivation and study of original costs and utilization of gas utility properties as prescribed in Federal Power Commission Order No. 73.

He has been associated with Lone Star and affiliated companies for 18 years in plant accounting and valuation work.

★ UNFINISHED BUSINESS ★

UNCLE SAM has "unfinished business" all over the world. But he's getting along with it, fast! We, of PAYNEHEAT, are concentrating on our war job. But when the shooting stops, our dealers can resume *their* unfinished business—with time-tested, years-ahead . . .

Payne

ZONE-CONDITIONING

Post-war successor to old-fashioned central heating! Carefree, fuel-saving gas heating and fresh air circulation . . . under finger-tip control *by zones or individual rooms.* You'll hear more about PAYNE Zone-Conditioning. But meanwhile, let's all help finish the *big* job. *Back the boys with Bonds!*

ARMY E NAVY

GAS FUEL HAS EVERYTHING

PAYNEHEAT

NEARLY 30 YEARS OF LEADERSHIP

Payne FURNACE & SUPPLY CO., INC., BEVERLY HILLS, CALIFORNIA

Post-War New Business Promotion of Industrial and Commercial Gas Sales

AT THE NATIONAL Metal Congress meeting, held in Chicago, October 20, 1943, there was held an industrial gas round table discussion, participated in by several gas engineers. Merle W. Martin, Industrial Engineer, Public Service Company of Indiana, Indianapolis, Ind., prepared a paper on Promotion of Industrial Gas Sales, which was presented at the round table discussion by Nelson R. Gorsuch. Mr. Martin's paper follows:

A most logical basis of planning for Industrial Gas Sales after the war would consist of an attempt to appraise those factors which will influence the post-war potential markets which use gas. Among those factors are:

1. Industrial business that will be lost due to cancellations of Government war contracts.
2. An appraisal of the extent that reconversion to peace-time goods will compensate for volume of sales lost, when war production stops.
3. The effect of new industrial gas applications developed under war-time conditions.
4. The extent to which induction heating will displace heat treating processes formerly using gas as a fuel.
5. The amount of industrial gas load lost during the war emergency period due to limitations and Government restrictions placed on adding new and additional loads.
6. The estimate of the availability of supply of fuel oil and its probable selling price as a fuel for manufacturing processes.
7. What will be the nation's post-war total business volume, and what opportunities would such a national market offer the industrial gas sales?

The following represents an effort to evaluate these factors enumerated above:

1. Nearly all industrial gas sold at the present time is used in some manner for the production of war goods. Much of this business undoubtedly will be lost and will be required to be replaced by production of peace-time goods. However, indications are our national policy will be to taper off war contracts, rather than abrupt cancellations.
2. Generally speaking, we have not experienced an exceptionally large increase in equipment and production capacity requiring gas as an industrial fuel in the territory served by this Company. It is to be expected, therefore, that conversion to manufacture of peace items will compensate to a large extent for the business lost due to war contract cancellations. This figure is estimated to be approximately 80%.
3. Many new industrial gas applications have been developed due to emergencies of war-time manufacturing. A large proportion of these innovations has not yet appeared in our territory, so logically we may expect the development of these new potential applications after the war.
4. Undoubtedly, induction heating is going to take some business that formerly has been a manufacturing process making use of industrial gas. New gas application methods will counteract this effect to some extent, but we cannot expect to hold all types of heat treating processes against induction heating competition.
5. There has been a considerable amount of available and potential industrial gas business denied during the war emergency because of Government restriction and limitation to the sale of natural gas. Given a reasonable amount of time, we anticipate securing such business after the war.
6. The proximity of fuel oil pipe line deliveries to the territory we serve would ordinarily indicate strenuous competition after the war from oil as a manufacturing process fuel. However, present trend of thought would lead us to believe the availability of supply may restrict the use of oil as a fuel for manufacturers' processes.
7. A study of market potentials after the war indicates that if we are to enjoy full employment of the then available manpower, the total gross national output would be approximately 40% greater than our last peace-time year of 1940.

On this basis, it is believed industrial gas sales would increase at a relatively proportionate rate.

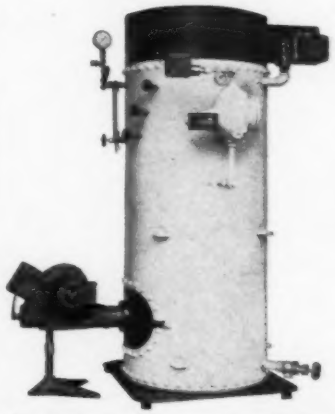
We believe it possible to actively promote the sale of both industrial and commercial gas in the post-war period without any increase in personnel. However, it is entirely possible that some re-arrangement of the Industrial Department might be made so as to more effectively make use of the department.

Advertising and Promotion

We feel that it is important to maintain close contact with management and operating personnel of our industrial accounts in the post-war period. Frequently, we are able to anticipate possible changes in competitive situations through intimate and friendly customer-relations. This type of long range promotion is possible only through a reasonable amount of participation outside of strictly business activities of our customers, such as engineering societies and national gatherings of metal and trade associations.

Adequate individual representation of our Company with management of our Industrial accounts necessarily requires certain expenditures not common with other departments of the gas business. In every instance we believe that the representation of the Company on matters pertaining to Industrial Gas Applications should be wholly within the jurisdiction and control of the Industrial Gas Department with local contacts being made only upon suggestion of the Department. This operating set-up will eliminate the possibilities of misunderstandings between our Company and the customer.

LATTNER
GAS — OIL BOILER
3 HP to 35 HP.



Burns natural gas or regular furnace oils with equal efficiency using same burner.

P. M. Lattner Mfg. Company
Cedar Rapids, Iowa

War Production Board and Other Administrative Orders

Control of Materials Production

Donald M. Nelson, Chairman of the War Production Board, announced Jan. 16th that WPB will keep production for civilian purposes out of labor shortage areas when necessary to prevent interference with war production.

Mr. Nelson said, "the WPB will use its powers of allocating materials and production in order to minimize new demands for labor in areas where every available worker is needed by plants already engaged in production for the armed forces."

Hereafter the WPB will carry out the following measures to insure that additional non-miiltary production is carried out only in areas where a surplus of manpower exists over and above the needs of war plants:

Materials will be allocated for new production by WPB only after WPB has determined that such allocation will not interfere with the manpower needs of war production.

The WPB will not grant authority to produce, purchase or use materials which will cause an increase of employment in areas where labor shortages already exist or are anticipated in the predictable future, if such an increase will endanger more urgent production.

As additional materials and facilities become available, increased production for civilian purposes will be permitted only where it has been ascertained that there is an available labor supply, over and above the needs of war production.

Power, Water, Gas and Central Steam Heat, Limitation Order L-174 Revised December 22, 1943

Revised designations of industrial and public consumers of manufactured gas who must receive preferential treatment from gas utilities was announced Dec. 22nd by the War Production Board, with revision of Schedule A to Limitation Order L-174. Changes in the schedule bring it into substantial accord with the list of preferred users of natural gas now contained in Utilities Order U-7, and reflect current conditions in war production programs.

Revocation of General Directive No. 1 to L-174 also was announced. Elimination of this directive places gas consumers owning any type of standby equipment on an equal footing for purposes of curtailment in cases of gas shortages. Previously, those with coal burning equipment were the first to have gas deliveries reduced in such circumstances.

Brass and Copper Tubing

The War Production Board announced Jan. 22nd that it has prohibited the manufacture of new brass or copper tubing, pipe or fittings for installation in gas supply and gas distribution systems.

Pipe and Fittings

Frozen inventories of copper and copper base alloy pipe, tubing and fittings in the hands of utilities were freed Jan. 24th, the War Production Board announced, for use in underground gas and water supply and distribution installations outside buildings.

This action was effected by amending Supplementary Conservation Order M-9-c-4 and was made possible by the better supply-demand situation of copper ingot, which makes purchase of completely fabricated material for remelt no longer necessary. In the past, finished products were remelted to furnish ingots for items more needed in the war effort.

The amended order makes available the frozen stocks of water and gas utilities as of January 1.

WAR PRODUCTION BOARD

Washington, D. C.

January 13, 1944

An Open Letter to Industry:

As the war goes into its decisive phase, we must summon every effort to get the greatest hitting power to the right places at the right time.

This means enormous expenditure of weapons and equipment. We have learned from each of our assaults on Axis outposts, the heavy cost in war materials.

We are now producing more than 250,000 tons of steel a day ... and half that steel comes to the mills as scrap. As we mount our greatest attack, our need for scrap becomes ever more pressing.

A year ago the nation rallied behind the Scrap Drive. Now we are asking you to "take another look". Vast quantities of iron and steel scrap are still available. The mills are only about two months ahead of the scrap supply. Any additional manpower shortage or unfavorable weather condition could produce another serious scrap shortage. This must not happen!

The War Production Board is relying on industry. You have the heavy scrap that is so much needed. And we are confident that you will come through as patriotically this time as you did before.

Reserves have been shrinking - a safe level must be maintained! Only in this way will we be sure that, come what may, we shall have enough weapons to deliver the final, crushing blow that will put the Axis out of action.

Signed - Donald M. Nelson
Chairman, War Production Board

Plumbing and Heating Equipment

[General Limitation Order L-79, as Amended Jan. 15, 1944]

Section 3288.31 General Limitation Order L-79, is amended to read as follows:

§ 3288.31 *General Limitation Order L-79*—(a) *What this order does.* The purpose of this order is to conserve the supply and direct the distribution of plumbing, cooking and heating equipment by preventing the sale of certain essential items on List A except for necessary replacements, or on rated orders. These are items, the production of which is restricted, and which can be made available to essential users only. The order provides a rating to enable sellers to get these items for necessary replacement. It permits other items of plumbing and heating equipment to be bought by sellers on unrated orders without restriction but provides a preference rating to enable sellers to buy these non-restricted items when a rating is needed. No preference ratings are assigned to consumers and deliveries to consumers for replacement and repair do not have to be on rated orders. The order supersedes the previous version of L-79, as well as General Preference Order P-84.

(b) *Assignment of preference ratings.* Preference rating AA-3 is assigned to any seller to enable him to get the following:

(1) Equipment shown in List A, including repair parts.

(2) Repair parts only for items on List B, and repair parts for stoves rationed by the O.P.A. under Ration Order 9-A.

(3) All other equipment, material and parts which are used to supply, store and heat water, to remove waste matter and water-borne waste, to treat waste matter chemically, and to heat buildings, including electric heat controls. Any rating under this paragraph cannot be used, however, to get equipment specifically designed for industrial processing, fire protection, the production or transmission of power, or for use by a public utility, equipment using electricity as fuel, heat exchangers subject to L-172, fans and blowers as defined in L-280, steel or wrought iron pipe or steel sheets, or equipment specifically designed for refrigerating or dehumidifying, or portable items such as pans or sump pumps which are not designed to be built into or fastened to the building in which they are used. Directions will from time to time be issued specifying items which are subject to this paragraph and items which are excluded.

(c) *Exception.* No rating is assigned to any delivery to which a rating is assigned by CMP Regulation 9A.

Coal Tar

(Conservation Order M-297 as Amended December 23, 1943)

The fulfillment of requirements for the defense of the United States has created a shortage in the supply of coal tar acids for defense, for private account, and for export; and the following order is deemed necessary and appropriate in the public interest and to promote the national defense:

(1) No producer or distiller shall burn as fuel or otherwise use in excess of 1,000 gallons of coal tar during any calendar month except for purposes of distillation, and no producer or distiller shall deliver in excess of 1,000 gallons of coal tar during any calendar month to any person other than a distiller, unless:

(i) The coal tar shall have a low-boiling tar acid content of less than ½ of 1%.

(ii) The coal tar is to be used for application to or treatment of ingot molds or fish nets (qualities hereby exempted are in addition to the 1,000 gallons referred to above); or

(iii) Specifically authorized by the War Production Board.

Coke Ceiling Raised

Ceiling prices on all by-product and retort gas coke produced in the East were raised 50 cents per net ton by the Office of Price Administration January 22 to compensate for increases in labor and coal costs experienced during the last two years, by Amendment 2 to Maximum Price Regulation No. 29.

The Eastern territory in which the 50-cents-per-net-ton increases are authorized includes all Atlantic seaboard States, Vermont and West Virginia, and the Eastern part of Ohio.

Where area ceilings have not been established, dealers will be permitted to automatically pass the 50-cents-per-ton increase on to consumers, OPA said. Where area ceilings have been established, appropriate adjustments, permitting the passing on of the increase to users, are expected to be made shortly.

Liquefied Petroleum Gases

Petroleum Administrator for War Harold L. Ickes Jan. 24th assured consumers that the current nation-wide difficulty in obtaining liquefied petroleum gases is a temporary one and will be corrected as soon as the specially constructed tank cars used to haul these gases can be returned to this type of service.

Administrator Ickes said:

"Some distributors of liquefied petroleum gases are finding it increasingly difficult to meet consumer demands for propane and butane. This does not mean that there is an over-all shortage of the products. Rather, the difficulty is mainly one of transportation, which is particularly affected by changes in distribution patterns and the seasonal peak in demand.

"Specially constructed tank cars are required to move these products from the refineries and natural gasoline plants to the distributing centers. In recent months, it has been necessary to divert many of these tank cars to emergency service for the movement of raw materials for synthetic rubber and aviation gasoline, which are urgently required for the war program.

"How long this shortage of transportation will last is not definitely known. It is hoped that in the near future enough cars will be returned to this petroleum service so that more normal delivery services can be resumed by the distributors.

Safety and Relief Valves

A Simplified Practice Recommendation for Bronze Pop Safety Valves, and Bronze, Iron, and Steel Relief Valves, has been approved for promulgation, according to an announcement by the Division of Simplified Practice, National Bureau of Standards. It will be effective from February 1, 1944, and will be identified as "R204-44."

The recommendation includes Bronze Pop Safety Valves, and Bronze, Iron, and Steel Relief Valves suitable for steam, oil, water, air, and gas in industrial service, and for marine service where applicable. The simplified list will satisfy 95 per cent of the demand for these valves.

The development of this recommendation was undertaken at the request of the Shipbuilding Division of the War Production Board in cooperation with the Segment Committee

(Concluded on page 53)

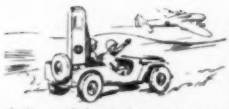
Portland Gas & Coke Company set many records in its 85th year of service. Those of especial interest are summarized in this report:

THE DEMAND for Portland gas was greater than in any other year of the Company's history, totaling 6,391,449,000 cubic feet. This was 12.3% more than in 1942, 43.2% more than in 1941. This huge volume of gas went to 99,509 customers, more than 10,000 of whom have been added since the outbreak of the war. Meeting the tremendously expanded needs of a crowded war production area has been our big responsibility for the past two years and will continue to be our major job in 1944.

IN THE TWO YEARS America has been at war, Portland Gas & Coke Company has produced 181,000 tons of Gasco Briquets. This is almost as much as were manufactured in the previous four years. This greatly stepped-up production means that Gasco Briquet manufacturing and delivery crews have kept operations at full speed, making every movement and every minute count. Thanks to their good work, hundreds of families who might otherwise have been cold enjoy the even, economical, ash-free warmth of Gasco Briquets, the Northwest's best solid fuel.

Uncle Sam asks you to use gas wisely. For when you save gas, you also save manpower, transportation and raw materials . . . all vital to the war effort. Your conservation has been effective . . . and both Uncle Sam and your Gas Company appreciate the heat-saving habits you have practised so faithfully. But please don't relax your conservation. Some of our coldest weather is still to come.

GAS
IS WAR MATERIAL
Use it wisely!



REMEMBER when you could drive up to a Gasco Motor Fuel pump and say, "Fill 'er up," knowing you were getting miles of quiet, powerful performance. The benzol that gave Gasco Motor Fuel its anti-knock qualities is still made by your Gas Company — but it's all going into vitally needed aviation gasoline and synthetic rubber. After the war, though, Gasco Motor Fuel will again be waiting for you at your service station — Portland Gas & Coke Company is also contributing substantial quantities of other by-products to the war, including coke and pitch for aluminum production, solvents and naphthalene.

WITHOUT CAPABLE PEOPLE to operate them, even the best of equipment and materials are worth nothing. So the major credit for our achievements in 1943 must go to the 680 skilled and experienced men and women who are responsible for giving you such good service. We're proud of them. We're proud, too, of the 81 absent members of the Gas Company organization who are now serving in the armed forces of the United States. Just as soon as their war service is completed, they'll be welcomed back to jobs with a future in this progressive, long-established Oregon industry.

OVER-ALL LIVING COSTS have increased greatly in three years. Our costs for labor and materials have gone up, too. But none of our prices have been increased. *You still buy Portland gas at prewar bargain prices*, the lowest in the entire Pacific Northwest. Gasco Briquets haven't gone up, either, which makes them a bigger value than ever.

As we start our 86th year, we want you to know that we appreciate your business and are sincerely grateful for your cooperation which is helping us do our wartime job.

PORTLAND GAS & COKE COMPANY

ONE OF A SERIES OF NEWSPAPER ADVERTISEMENTS INSERTED BY PORTLAND GAS & COKE COMPANY, PORTLAND, OREGON. THIS ONE (ORIGINAL SIZE SIX COLUMNS WIDE) WAS USED IN DAILIES AND WEEKLIES THROUGHOUT THE TERRITORY THEY SERVE.

BARBER BURNERS

For All Gas Appliances

S-80

Z-21

Under wartime stresses of fuel shortages and material scarcities, the economical, continuous, trouble-free performance of gas appliances, now in operation, equipped with Barber Burners, is an outstanding contribution to the war effort. Our factory is now concentrated on combat equipment. For permitted purposes, our regular line is still supplied. Later, Barber Burners and Regulators will again be available to all.

Latest Catalog on request.

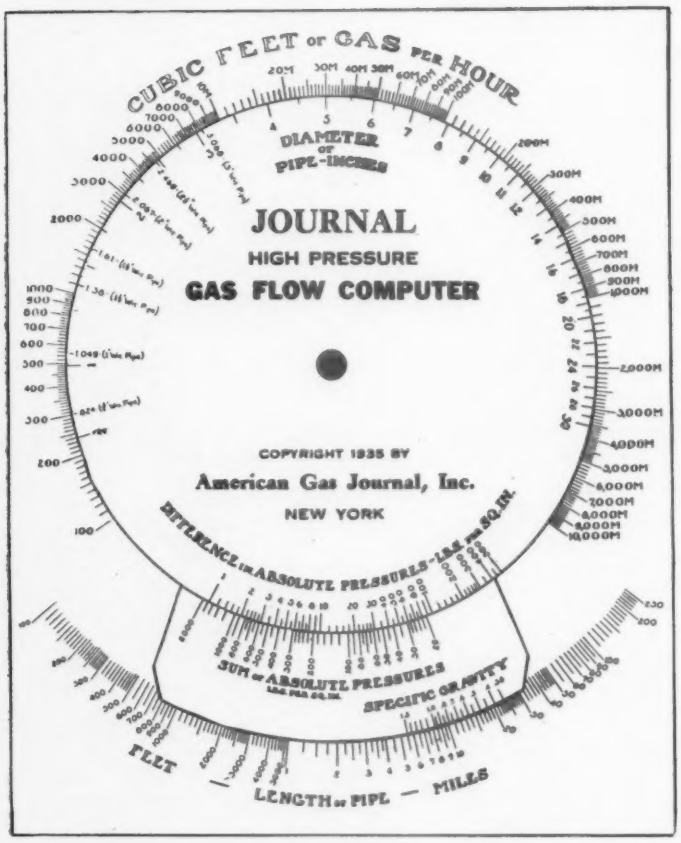
THE BARBER GAS BURNER CO.
3704 Superior Ave. Cleveland, O.

CLEVELAND

"A" TYPE METERS
"B" TYPE METERS
DIAPHRAGMS

Cleveland Gas Meter Co.
2180 East 65th St., Cleveland, Ohio ESTABLISHED 1895

"Journal" Gas Flow Computers



New Improved Gas Flow Computers now available of durable celluloid, encased in a convenient leatherette cover with complete instructions.

Actual Size 6¼ x 7½

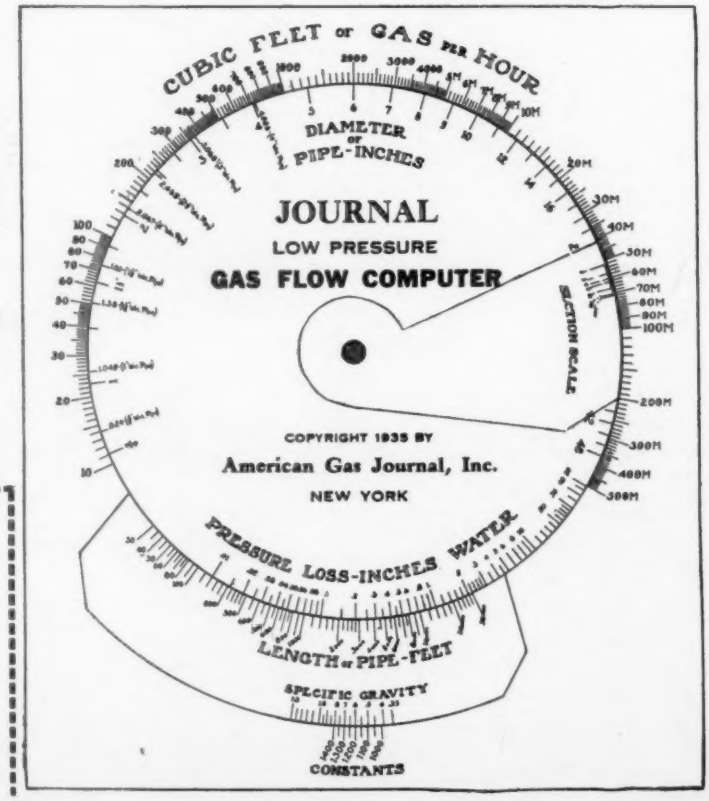
High Pressure Computer Range:

Cu. Ft. of Gas Per Hour—100-10,000 M
Diameter of Pipe Inches ¾-30
Difference in Absolute Pressure—Lbs. per sq. in. 1-500
Sum of Absolute Pressures—Lbs. per sq. in. 2000-20
Specific Gravity 1.5-.35
Length of Pipe—Feet 100-5000
Length of Pipe—Miles 1-250

Low Pressure Computer Range:

Cu. Ft. of Gas Per Hour—10 to 500 M
Pipe Diameter ¾" to 48" (including standard and actual weight up to 4")
Pressure Loss Inches .01-10.
Length of Pipe—Feet 30-30,000
Specific Gravity 1.5-.35
Constants 1400-1000

Price $3.50 Each, Postage Prepaid



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53 Park Place, New York

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....HIGH Pressure Computer

....LOW Pressure Computer

NAME .....

ADDRESS .....

American Gas Association Activities

Program Completed for American Gas Association Technical Conference on Domestic Gas Research

The two-day program for the American Gas Association Technical Conference on Domestic Gas Research which will be held in the Statler Hotel, Cleveland, Ohio, has been completed and invitations were recently sent to appliance companies inviting them to send members of their engineering staffs to the conference. The conference is being sponsored by the Committee on Domestic Gas Research, Everett J. Boothby, Vice President and General Manager, Washington Gas Light Company, Chairman, and F. M. Banks, Vice President, Southern California Gas Company, Vice Chairman. The Committee on Domestic Gas Research is conducting this conference primarily for the engineers and other technical men of appliance manufacturers in order that they may become thoroughly familiar, from the technical angle, with the fundamental research sponsored by the committee and which is reported from time to time in the form of research bulletins.

Featured on the program will be technical papers by members of the research staff of the American Gas Association, these papers being based on the fundamental domestic gas research that has been conducted by the Laboratories during the last few years. The members of the Technical Advisory Subcommittees for the several individual projects will also present papers. Luncheon speakers will be outstanding executives who are familiar with the problems involved in fundamental domestic gas research.

Subjects selected for the program are:

The Technique of Advancing Atmospheric Gas Burner Design—Mixing Tubes, Burner Ports and Flame Characteristics

The Technique of Advancing Atmospheric Gas Burner Design—Optimum Volume and Noise of Extinction Characteristics

Noise and Heat Transfer Factors in the Design of Gas Heating Appliances

The Relationship of Fundamental Research to Gas Appliance Development

Practical Phases of Fundamental Gas Cooking Research—Top Sections

Practical Phases of Fundamental Gas Cooking Research—Ovens and Broilers

Fundamental Gas Water Heating Research—Efficiency Aspects

Design and Performance Features of Post-War Gas Burners—Aerated Flames

Design and Performance Features of Post-War Gas Burners—Non-aerated Flames

Fundamental Gas Water Heating Research—Combustion Aspects

On Friday afternoon a special feature will be three panel sessions conducted by the three Technical Advisory Subcommittees. One will be on gas cooking, one on gas water heating and one on central gas space heating. These panel sessions will discuss problems involved in translating and applying the fundamental research data to help in producing better gas appliances. Luncheons for all those in attendance will be held on Thursday and Friday. Registration will begin at 8:30 A.M. Thursday. Sessions will be held on Cleveland local time, which is one hour slower than railroad time.

American Gas Association Testing Laboratories will have an operating exhibit at Hotel Statler during the conference. Certain new ideas concerning burners and burner performance, aeration, ignition, venting, etc., will be included in this exhibit. The Laboratories at 62nd Street will be open also on Saturday morning, February 19, when the staff will be available for consultation by those who have registered at the Research Conference. Inspection of Domestic Gas Research set-up and detail inspection of research data can be made at the Laboratories on Saturday morning.

The Conference in Cleveland on February 17 and 18 is in charge of the following group representing the Committee on Domestic Gas Research: Eugene D. Milener, Conference Manager; R. M. Conner; Keith T. Davis; L. R. Mendelson; Paul R. Tappan; William R. Teller; F. E. Vandaveer.

Rochester Selected for War Conference on Industrial and Commercial Gas

The 1944 American Gas Association War Conference on Industrial and Commercial Gas will be held on March 30 and 31 at Hotel Seneca, Rochester, N. Y., it has just been announced by Charles G. Young of Springfield, Mass., Chairman of the Industrial and Commercial Gas Section.

The three-fold objective of the Conference is: (1) to study equipment and practices in gas utilization in war production plants and military camps and bases so that improvements can be applied wherever they will help the war effort; (2) to study the requirements of altering or replacing old industrial gas equipment in war plants and to rehabilitate commercial equipment during the coming reconversion period; (3) to plan for maximum industrial and commercial gas and equipment sales in the post-war period.

This Conference alternates yearly between natural and manufactured territories. The program is nicely balanced to include subjects that are of interest to both natural gas and manufactured gas men and equipment manufacturers in the industrial and commercial field. The program committee is under the able direction of Mr. Ivar Lundgaard, Manager, Industrial Department, Rochester Gas and Electric Corporation. Mr. Lundgaard's committee, which has met with him in Rochester consists of Messrs. R. Victor Bauer, Ebasco Services Inc., New York, N. Y.; Karl Emmerling, The East Ohio Gas Co., Cleveland, Ohio; Henry M. Heyn, Surface Combustion, Toledo, Ohio; F. B. Jones, Equitable Gas Co., Pittsburgh, Pa.; Ralph L. Manier, Central New York Power Corp., Syracuse, N. Y.; James C. Patterson, Carrier Corporation, Syracuse, N. Y.; Leo Sullivan, Rochester Gas & Electric Corporation, Rochester, N. Y.; Eugene D. Milener, Secretary, American Gas Association, New York, N. Y.; Charles G. Young, ex officio, Springfield Gas Light Co., Springfield, Mass.

News of the Gas Industry

New Cp Gas Range Program Aimed to Create Jobs for Service Men and Build Postwar Sales

"Finding jobs for more than 10 million service men and millions of more jobs for war workers is one of the major problems facing postwar America, and it is up to American business to create those jobs," said Lloyd C. Ginn, Chairman of CP Gas Range Manufacturers' Sales Management Committee in announcing a nation-wide CP Business Building Plan designed to create a backlog of orders which will start peacetime industry's wheels turning immediately after the war.

Built on the theme, "You Can Help Make Peacetime Jobs for Service Men and Women by Planning Now To Buy Your New CP Gas Range with Extra War Bonds," the CP Business Building Plan will urge the 18 million gas customers and the thousands of new brides and brides to be to set aside $100 to $150 extra in War Bonds now to buy a CP Gas Range when new peacetime models are available. The current CP campaign consists of three steps:

1. Customers are urged to set aside $100 to $150 in extra War Bonds now so they can buy a new CP Gas Range immediately after the war.
2. From a special Postwar CP Prospect Card, gas range dealers and utilities will obtain information on exactly what type of CP Gas Range each customer wants together with other pertinent facts. This prospect card is filed for later follow-up and sale.
3. No money changes hands. No contracts are signed. But definite orders can be taken and priority listings set up if the individual dealer desires.

In addition to increasing the sale of War Bonds and helping to make good jobs for service men and women immediately after the war, this program will enable gas utilities, department, furniture, hardware stores and other gas range dealers to pre-sell gas for cooking and CP for certified cooking performance and to build now profitable postwar business on high quality gas ranges, according to CP Gas Range Manufacturers.

By buying extra War Bonds now, prospective purchasers can create a financial backlog and buy a CP Gas Range out of earnings without interfering with savings plans, CP range manufacturers point out.

Because of its flexibility and simplicity, dealers and gas utilities do as much or as little as they wish with the program and can expand it to cover all items they handle.

A complete kit giving full details of the CP Business Building Plan, and containing a colorful 25 x 38 inch window-display poster, a unique War Bond holder, bill stuffers, counter pieces, ready-to-run newspaper advertisements, stickers to be used on letters, mailing pieces and bills, publicity releases, prospect cards and other material is available on request from the Association of Gas Appliance and Equipment Manufacturers, 60 East 42nd Street, New York 17, N. Y.

In gas appliance dealers' and gas utilities' windows all over America, this colorful red, white and blue 25"x38" window poster will help create jobs for service men and build postwar sales of gas ranges bearing the CP seal of Certified Performance.

The Bond Folder is designed to be used as a safe depository for all the War Bonds owned and contains a unique sheet on which bonds owned can be listed and the sheet kept separately so that if bonds are lost, a record is available from which duplicates can be issued.

As a part of the campaign, dealers and utilities are urged to set up a Postwar Home Planning Center and to assist their customers in planning their peacetime purchases. The program also includes a plan by which every employee can become a salesman for post war selling.

The campaign will be supported by direct mail and publicity programs, newspaper advertising and trade paper advertising in the department store, hardware, furniture, appliance dealer and gas utility fields.

Unique in the major appliance merchandising field, the Certified Performance Gas Range was introduced in 1938 to provide uniform cooking performance standards. Gas ranges bearing the CP Seal are built by individual range manufacturers to meet high performance specifications drawn up by engineers and home economists of the entire gas industry.

Merchandise leaders agree that the CP program substantially increased the sale of better quality gas ranges and changed gas range buying from "buying for price to buying for cooking performance." CP specifications now being formulated for postwar homes are being based on field studies made among more than 1,500,000 gas customers, gas appliance dealers, architects, builders and gas utilities in all parts of the country and on engineering and home economic studies being conducted by range manufacturers and gas utilities alike.

Gas range manufacturers now sponsoring the CP program include: A-B Stoves, Inc., American Stove Co., Caloric Gas Stove Works, Clare Bros. & Co., Cribben & Sexton Co., Detroit-Michigan Stove Co., The Estate Stove Co., Glenwood Range Co., Grand Home Appliance Co., James Graham Mfg. Co., Hardwick Stove Co., Moffats, Ltd., O'Keefe & Merritt Co., Roberts & Mander Stove Co., Geo. D. Roper Corp., Standard Gas Equipment Corp., The Tappan Stove Co., Western Stove Co., Inc.

Tappan Stove Co. Earns Guidon of Merit

A guidon of merit was presented recently to guards at the Tappan Stove Company, Mansfield, Ohio. The award was made by Lt. Col. R. H. Meyers, district chief of Security and Plant Protection, in recognition of excellence in "military appearance, neatness of individuals and uniforms, cleanliness and working condition of firearms, and ability to assemble, drill and assume their posts."

A large audience, including all the employees of the company, witnessed the ceremony of presentation. On the platform were representatives of the United States Army and Navy, the Mansfield, Ohio, Police and Fire Departments, the Ohio State Patrol, and officers of the Tappan Stove Company.

W. R .Tappan accepted the guidon for the firm and then presented it to Gilbert Oswalt, chief of the guards. W. H. Tappan, vice president, was master of ceremonies, and the American Legion Color Guard handled the raising of the flag.

The Tappan Stove Company is manufacturing many products for the Armed Forces, including the Tappan Sky Kitchen and Tappan Droppable Gasoline Tanks.

West Coast Domestic Research Conference in March

The Ambassador Hotel, Los Angeles, California, will be the scene of the west coast Technical Conference on Domestic Gas Research on March 15 and 16. This conference, the first of its kind to be held on the Coast, will be sponsored jointly by the Committee on Domestic Gas Research of American Gas Association, Everett J. Boothby, Washington, D. C., Chairman; Post-War Appliance Committee of Pacific Coast Gas Association, Harry L. Masser, Los Angeles, Calif., Chairman; and Manufacturers Section, Pacific Coast Gas Association, H. A. Sutton, Chairman.

The Conference will follow the general lines of the February 17 and 18 Research Conference in Cleveland and will be primarily for engineers and designers of appliance manufacturing companies. The fundamental research work sponsored by the Committee on Domestic Gas Research, and which is reported on in the form of technical bulletins, will be the foundation on which most of the papers and presentations will be based. Technical papers will be given by members of the Cleveland and Los Angeles Laboratories' research staffs, by members of the Technical Advisory Subcommittees for the several projects, and by prominent officials of gas companies and appliance manufacturing companies. Demonstrations of research will be given at The Ambassador during the Conference and on a more elaborate scale at the Pacific Coast Branch of the American Gas Association Laboratories the morning after the Conference closes.

A.G.A. Research Bulletin Covers 100% Primary Air Burners

New and valuable data on design and application of gas appliance burners are presented in Research Bulletin No. 20, shortly to be released for publication by the Committee on Domestic Gas Research of the American Gas Association. Recognizing the great importance of burner design in the further development of domestic gas appliances, extensive study has been devoted to its fundamentals as a part of the extensive Domestic Gas Research program now in progress at the Association's Laboratories. Three research bulletins previously published covered conventional Bunsen type burners. Those utilizing all air needed for combustion as primary air are now similarly treated.

Contrasted with burners of the ordinary atmospheric type, those employing all air for combustion in the form of primary air present important differences. Several important advantages may be attained through their use as demonstrated by the studies now reported. Chief among these are reduced combustion space, greater heat liberation and higher rate of heat transfer. Design features to best accomplish desired results are fully discussed. These apply to burners operated on low gas pressures commonly employed, as well as those supplied for use under higher pressures.

A chapter is devoted to performance of various small burners employing all air as primary air. These are considered from the standpoint of their application to gas range top sections. However, they should be capable of application to other types of domestic gas appliances as well. Experimental results clearly show possibilities of high efficiencies and good heat distribution. For gas range application particularly, importance of advantages offered by the use of such burners deserve special attention.

CONVENTION CALENDAR

February

17–18 *American Gas Association.* Conference on Domestic Gas Research. Hotel Statler, Cleveland.

March

23 *New England Gas Association,* Annual Meeting, Boston, Hotel Statler.

30–31 *A.G.A. Technical Conference on Domestic Gas Research,* Cleveland, Ohio.

April

19–20 *Missouri Assn. of Public Utilities.* Annual Business Meeting, St. Louis, Jefferson Hotel.

June

5–7 *Advertising Federation of America,* Annual Meeting Hotel Sherman, Chicago.

6–8 *Public Utilities Advertising Association,* Annual Meeting Palmer House, Chicago.

6–8 *Southwestern Gas Measurement Short Course,* University of Oklahoma, Norman, Okla.

A.G.A. Constitutional Amendments

Voting on amendments to the Constitution and Bylaws of the Association, approved by the Executive Board on October 26 and 27 and submitted to the membership on November 24, closed early in January, resulting in 1821 ayes and 7 noes. Ballots incorrectly marked 38.

Accordingly, the Association now has a Natural Gas Department and a Manufactured Gas Department, each with a Vice-President of the Association as Chairman. The Vice-Presidents are ex-officio members of the Finance and Control Committee.

Hereafter, the Residential Section is the Residential Gas Section.

Missouri Association of Public Utilities

The Annual Business Meeting of the Missouri Association of Public Utilities will be held April 19 and 20, 1944, in St. Louis, Mo., at the Jefferson Hotel.

Oklahoma Utilities Association 1944 Officers

President: E. C. Joullian, President, Consolidated Gas Utilities Corporation, Oklahoma City.

First Vice President: George M. McLean, Oklahoma Gas and Electric Company, Oklahoma City.

Second Vice President: A. F. Potter, Manager, The Gas Service Company, Bartlesville, Oklahoma.

Treasurer: D. S. Kennedy, Vice President and Treasurer, Oklahoma Gas and Electric Company, Oklahoma City.

Secretary: Miss Kate A. Niblack, 626 Biltmore Hotel, Oklahoma City.

Austin Appointed Adv. Mgr. of Pittsburgh Equitable

James L. Austin has been appointed Advertising Manager of the Pittsburgh Equitable Meter Co., Pittsburgh, Pa., succeeding R. S. Reed, Jr., who has taken over the management of the new office of The McCarty Company recently opened in Pittsburgh.

L. M. Ayers Appointed Chairman A.G.A. Personnel Committee

L. M. Ayers, Industrial Relations Manager of the Peoples Natural Gas Company, the Hope Natural Gas Company, and the East Ohio Gas Company, has been appointed Chairman of the Personnel Committee of the American Gas Association according to a recent announcement by Ernest R. Acker, President of the A.G.A.

THE STACEY MANUFACTURING CO.
Engineers Fabricators Constructors
• Gas Holders • Gas Plant Equipment • Steel Plate Construction •
GAS HOLDER INSPECTION SERVICE
Cincinnati — Ohio
93
STACEY SINCE 1851
Years

Strickler Nominated for Re-election to U. S. Chamber of Commerce

T. J. Strickler, Vice President and General Manager of the Kansas City Gas Company, has been unanimously nominated by the Board of Directors of the Kansas City, Missouri Chamber of Commerce for re-election to the Board of Directors of the United States Chamber of Commerce.

Sudvarg Studio

T. J. Strickler

Major Strickler is nominated to represent the 7th election district which includes the states of Missouri, Kansas, Arkansas, Louisiana, Oklahoma, and Texas.

The Kansas City, Missouri Chamber of Commerce has sent his nominating petitions to all member organizations in the above states.

His election, however, will be subject to the vote of all councilors in the United States representing such member trade associations as the American Gas Association, as well as all Chamber of Commerce. The election will take place at the annual meeting of the United States Chamber of Commerce early in May.

Federal Power Commission Issues Certificate of Public Convenience to Northern Natural Gas Company

The Federal Power Commission announced January 10th its order issuing a certificate of public convenience and necessity to the Northern Natural Gas Company, Omaha, Nebraska, authorizing it to acquire and operate all the natural gas transmission lines, gathering lines, town-border stations, and certain appurtenant properties located in southwestern Kansas and owned by its wholly-owned subsidiary, Argus Natural Gas Company, Inc.

Northern Natural proposes to continue to perform the service heretofore rendered through the facilities to be acquired, including delivery and sale of natural gas at wholesale to the Argus company's distribution systems and industrial and main line customers. The Argus company will retain ownership and operation of the distribution systems and facilities used to serve its industrial and main line customers.

The facilities proposed to be acquired and operated by the Northern Natural Gas Company are used in part by Argus for the transportation of natural gas from wells in the Hugoton gas field in Kansas and the sale of such gas in interstate commerce to Northern for ultimate public consumption in Nebraska, Iowa, Minnesota, and South Dakota, and for supplying natural gas to the Argus company's distribution systems located in Cimarron, Copeland, Dodge City, Elkhart, Ensign, Fowler, Garden City, Hugoton, Meade, Montezuma, Moscow, Plains, Rolla, Satanta and Sublette, and certain industrial and main line customers, all in Kansas.

Taber Operating V.P. Atlanta and Florida Utilities

Rock Granite Taber has been named operating vice president of Atlanta Gas Light Company and Florida Public Utilities Company, according to announcement by H. Carl Wolf, president. His headquarters will be in Atlanta, Ga.

He succeeds Mr. E. J. Meade, who resigned to become associated with the Texas Public Service Company of Austin, Texas.

R. G. Taber

Mr. Taber resigned as vice president of Stone & Webster Service Corporation to accept the vice presidency of the Georgia and Florida companies. He has been connected with the Stone and Webster for the past 37 years in the various departments of engineering, construction, service and operations of public utilities.

Mr. Taber's past connections include the following: Vice President of Michigan Federated Utilities; vice president of Fall River Gas Works Company at Fall River, Mass.; president of Texas Public Service Company of Austin, Texas and president of Missouri Utilities Company, Cape Girardeau, Mo.

Mr. Taber is a native of Dallas, Texas and is a graduate of the Texas Agriculture and Mechanics College.

Lone Star Sells Galveston and El Paso Properties

The Lone Star Gas Company has sold the El Paso properties to the Southern Union Gas Company and the Galveston properties to the Texas Public Service Company, according to a recent announcement made by Lone Star president D. A. Hulcy.

Announcement came after El Paso voters had defeated a proposal for municipal ownership of the El Paso Electric Company and Galveston had voted down municipal ownership of the gas properties.

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The mark of unerring dependability in purification
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Long Island City 2, New York

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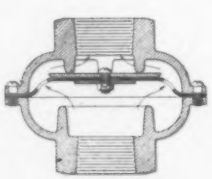
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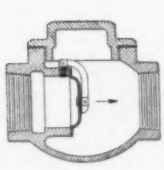
NORWALK VALVE COMPANY
85 Spring St. South Norwalk, Conn.

Colonel W. F. Rockwell Elected to Boards of Two Banks Returns to Private Business

Colonel W. F. Rockwell, industrial leader, was recently elected to the boards of the First National Bank and Peoples-Pittsburgh Trust Company of Pittsburgh, Pa. Coincidentally it was announced that he had resigned his position as Director of Production for the U. S. Maritime Commission in order to devote full attention to the manufacturing details of war work being done by his several interests.

Col. W. F. Rockwell

Colonel Rockwell, who is President of Pittsburgh Equitable Meter Company—Merco Nordstrom Valve Company, made the following statement:

"The recent untimely death of Walter H. Parker, Vice President in Charge of Manufacturing, hastened the need for my return to active participation in business.

"My resignation to Admiral Land, Chairman of the Maritime Commission, was submitted when it became apparent that the shipbuilding program was 'over the hump' and that my services must be devoted ot the production of war goods manufactured in our several plants.

"Our organization has contributed heavily to the war program both in materials produced and in trained man-power that has been released to branches of the service. For example, here at Pittsburgh Equitable Meter Company, Vice President and Chief Engineer Allen D. MacLean is serving as Assistant Director of Production for the Maritime Commission; Vice President and Sales Manager A. E. Higgins is a Major in the U. S. Air Corps, and Vice President and Controller W. F. Rockwell, Jr., is a Lieutenant in the Army. Over 600 of our workmen are now serving in some branch of the armed forces."

Under the guiding hand of Colonel Rockwell, the Production Division of the Maritime Commission has compiled an enviable record in ship construction. The greatest fleet in history has been sent down the ways to assure the necessary bottoms with which to transport our troops and support them while pursuing the aggressors on foreign soil.

Reorganization Plans of Niagara-Hudson

Revision of the plan of reorganization of the Niagara Hudson System is being given consideraton by the management of the System, according to Earle J. Machold, president of Niagara Hudson Power Corporation, following a meeting of the Board of Directors January 28th.

The directors and management will endeavor to effect, without delay, a solution of the problems which will retain the benefits of this unified System for security holders and consumers.

Mr. Machold said "Consideration is being given to a revision of the plan of reorganization of the Niagara Hudson System in the light of the decision of the New York Public Service Commission, announced previously. The Niagara Hudson Power Corporation, since its organization in 1929, has built a unified system. We believe every effort should be made to preserve it.

"In further considering the Plan of Reorganization, the directors and management will endeavor, without delay, to promulgate a solution of the problems which will retain the benefits of this unified system for security holders and consumers."

Pipe Tools. Beaver Pipe Tools, Inc. of Warren, Ohio, in their 48 page catalog No. 44 illustrate and describe in detail their complete line of pipe tools and accessories. Prices conforming to O.P.A. regulations are given for each unit.

Fabricated Piping. A highly interesting illustrated book of 64 pages has been issued by the Flori Pipe Company of St. Louis, a company long in the business of pipe fabrication. It covers the various ways in which piping can be used and lists present market prices for every conceivable kind and size of fabricated piping. Write to Dept. L9 for copy.

Roper Manufactures War Model Gas Ranges

Production of war model gas ranges has been started by the Geo. D. Roper Corporation, Rockford, Illinois. After a year and a half of no range production, this new gas range is being built in limited quantities commensurate with the quarterly release of materials by the War Production Board. The ranges will be sold under provisions of the Stove Rationing Program.

Roper War Model Range

The Roper gas range now in production has big "3-in-1" oven, "E-Z-Roll" broiler with "Enamo-Grill," four "Speed" top burners including one of giant size and many other modern features. It provides facilities for oven, broiler and top burner cooking—all in compact space.

Ruoff Appointed Chairman of A.G.A. Accident Prevention Committee

George J. Ruoff, safety engineer, Central Hudson Gas and Electric Corp., Poughkeepsie, N. Y., has been appointed chairman of the Accident Prevention Committee of the American Gas Association, according to an announcement by Ernest R. Acker, president of the Association.

A major objective of the committee this year is to promote the safety of gas industry workers in wartime, a growing task because of the manpower shortage, increased production schedules and over-all emergency conditions. The committee is also concerned with improving the longtime safety record of the industry and sponsors individual and company awards for outstanding accident prevention achievement. Among the latter awards are the McCarter Medals, Million-Man-Hour Awards, and A.G.A. Meritorious Service Medal.

A graduate of Rensselaer Polytechnic Institute, Troy, N. Y., in electrical engineering in 1925, Mr. Ruoff is well qualified to head up this important activity.

THE GOODMAN STOPPER

Now has the "Z" handle for easy manipulation. When locked in place it holds Stopper cannot slip. Gas cannot pass. Adjusted in 30 seconds.

Ask for circulars on this and other distribution equipment.

Nearly a half century of service to the Gas Industry.

The Reliable Shut-Off for Street Mains

Safety Gas Main Stopper Co.
523 Atlantic Avenue, Brooklyn, New York

Personnel Transport Plane Cuts Travelling Time Over 80 Per Cent Between Cooper-Bessemer Plants

Recognizing the advantage of conserving valuable travelling time between their two plants at Mount Vernon, Ohio, and Grove City, Pa., officials of The Cooper-Bessemer Corporation, veteran engine builders, have acquired a five-passenger airplane which enables members of this manufacturer's executive staff to traverse the 160 miles separating the two plants in about one hour as against five to six hours required in these days of restricted motoring speeds and congested railroad service.

In addition to inter-plant use, the plane will save a great amount of valuable time in emergency trips to the company's branch offices throughout the country. One of the first long flights of this type was made recently when several Cooper-Bessemer officials flew from their Mount Vernon headquarters to their Dallas, Texas, office.

The plane, a modern Fairchild low-wing monoplane coupe, powered by a Wright Whirlwind seven-cylinder motor, has a top cruising speed of about 160 miles per hour, with a fuel range of 600 miles.

New CP Program Announced

Manufacturers' and Utilities' Committees Also Discuss Changes in CP Specifications

A new program designed to help keep the advantages of Gas and of CP Gas Ranges before the public as well as to contribute both toward the war effort and postwar employment, was approved by representatives of the American Gas Association's Domestic Gas Range Division and the Sales Management Committee of the Association of Gas Appliance and Equipment Manufacturers at a two-day meeting at the Carter Hotel, Cleveland on January 16 and 17. Full details of the new CP Program will be announced shortly.

The meeting also included a discussion of recommended changes in specifications of CP Gas Ranges. It was agreed that new specifications be revised to more accurately reflect functional rather than engineering standards.

Because of the growing importance of dealers in the distribution of Gas Ranges and other appliances it was decided to establish an advisory committee of retailers whose purpose it would be to help guide Gas Range manufacturers and utilities in their dealer relation and broad merchandising policy.

Several new manufacturers have indicated their desire to become members of the CP Gas Range group and the general enthusiasm for the entire CP program was said to have reached a higher degree than ever before.

Boone County Coal Corporation Joins Canadian Gas Association

The Boone County Coal Corporation, of Philadelphia, Pa., is represented in the Canadian Association by George R. Steere, well-known to Canadian gas men. He recently returned from the West Coast to take on active sales representation with the Boone County people.

G. M. Carvlin Becomes V.P. of Koppers Co.

Election of George M. Carvlin as a vice president of Koppers Company, Engineering and Construction division, is announced by J. P. Williams, Jr., president.

Mr. Carvlin had been an assistant to Joseph Becker, vice president of Koppers Company and general manager of the

George M. Carvlin

division, since 1940. He started with Koppers as a research engineer in 1925, later serving in the operating and sales departments.

His first position after being graduated from the University of Illinois in 1922, with a degree in chemical engineering, was with the Corn Products Refining Company, New York. He left that firm after three years to join Koppers.

Lone Star Executive Changes

D. A. Hulcy

D. A. Hulcy, president of the Lone Star Gas Company of Dallas, Texas, announces the following changes among executives of his Company.

Richard G. Soper retired as vice-president of Lone Star and general manager of its Dallas division, effective January 1. Mr. Soper had been with the company 35 years, coming to Dallas from Detroit, Mich. During his term of service the Dallas division grew from less than 6000 meters to 95,000.

Chester L. May, a vice-president of Lone Star who is known throughout the gas industry, was promoted to general supervision of all distribution properties of the system, including Dallas and Fort Worth. The company serves about 300 towns and cities in Texas and southern Oklahoma. Mr. May was born in Lima, Ohio, and has been with Lone Star since January, 1917. He has worked up through every phase of the business, and in the period 1925 to 1929 supervised the construction of more than 200 town plants.

Wesley F. Wright, who has been operating manager of the Dallas division under Mr. Soper, is promoted to succeed him as general manager of the division. He was born in Sullivan, Ind., and came to Dallas to join the Dallas Gas Co. in December, 1911, shortly after natural gas was turned into the mains. He has held membership on a number of A.G.A. committees.

Floyd L. Carmichall is appointed general manager of the Fort Worth division of Lone Star. Since September 1, 1933, he has been operating manager of this division.

The reorganization places the two principal departments of the Lone Star system under unified management. Elmer F. Schmidt, vice-president, is in charge of the gathering and transmission system.

Kaiser Earns Promotion with Detroit-Michigan Stove Co.

Fred A. Kaiser has been appointed Assistant to the President of Detroit-Michigan Stove Company, it was announced by John A. Fry, President of that company. Prior to his elevation to the new position, he was Sales Manager.

Mr. Kaiser has been associated with Detroit-Michigan Stove Company for the past ten years. Starting as a territory sales representative in Pennsylvania and New York when he joined the company in 1933, he later did similar work in Michigan. In 1938 Mr. Kaiser was made Sales Manager, and has held that position for the past five years. During the past sixteen months, most of his duties have been in connection with the company's new plant number 2, which is entirely on war work.

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FOR SALE
GAS EXHAUSTERS

Two Roots-Connersville Size 8 two impellor type, side intake and discharge gas exhausters both in serviceable condition.

Capacity—127,000 cubic feet per hour
Pressure—28" of water column
Power—125# steam
Drive—Direct connected
Prime Mover—Single cylinder vertical steam engine for 125# steam pressure
Speed—Variable
Size of Intake—16"
Size of Discharge—16"
Service—To exhaust .5 gravity foul gas from relief holder
Overall Dimensions—6' x 14' in Plan x 6' high
Bed Plate—Cast iron under exhauster and engine

Ready for immediate sale

SEATTLE GAS COMPANY
1511 Fourth Ave., Seattle, Wash.

Safety and Relief Valves

(Continued from page 44)

of the Valve and Fittings Industry Advisory Committee. The need for it was made apparent when an analysis of the requirements of claimant agencies disclosed that all of their needs could only be met by reducing the variety which the industry was being called upon to make.

Pending printing, a limited number of mimeographed copies of this simplified practice recommendation will be available and may be obtained upon request to the Division of Simplified Practice, National Bureau of Standards, Washington 25, D. C.

Hewson Appointed to National Advertising Copy Committee

H. Carl Wolf, Chairman of the Committee on National Advertising of the American Gas Association, announces the appointment of W. B. Hewson, manager of publicity and advertising of The Brooklyn Union Gas Company, to the national advertising copy committee. This committee collaborates with advertising counsel in preparing the gas industry's national advertising program.

POSITION WANTED

Married, 44 years old. Graduate Engineer with 20 years' experience in all phases of coke plant, blue and carburetted water gas plant operation, maintenance and engineering. Excellent record in industrial relations and production. Would like position as superintendent or manager of coke and gas plant. Employed at present but available on reasonable notice. No particular section of country ruled out but prefer Middle West or East. Address Box 131, c/o American Gas Journal, 53 Park Place, New York 7, N. Y.

Pittsburgh Equitable and Merco-Nordstrom Office

Announcement is made by Pittsburgh Equitable Meter Co., that one of their offices formerly located in Memphis, has been changed to Bona Allen Building, Atlanta 3, Georgia.

Titeflex, Inc. Is the New Name of Titeflex Metal Hose Co.

The Titeflex Metal Hose Co. of Newark, N. J., will hereafter be known as "Titeflex, Inc." The change has been announced by Mr. Elbert E. Husted, President of the Company.

Since 1914, the Titeflex Metal Hose Co. has specialized in the manufacture of flexible metallic tubing for the conveyance of fluids and gases for general industrial and automotive application.

Fuel Efficiency

(Continued from page 35)

and careful treatment, the low-grade product will give as good, if not better, results, than the high-grade, more expensive product. The patience of these men was sorely tried when some of the industrialists they called on raised a hullabaloo about low-grade coal being inferior.

Decentralization

That wartime baby, the building hastily requisitioned for essential production, came in for its share of attention by regional committees. It may be explained that the "blitz" caused, for security reasons, a decentralization of essential industrial production. The more isolated the rural location, the more the building or buildings suited the government's purpose. Many of the buildings had never before been used for industrial operation, or had produced an entirely different type of work. The major heating defects encountered in these converted structures were uninsulated walls, boilers and pipes, and also faulty roof construction.

Heat Value

The heat value of coal is on the up and up in Britain. In World War I, it was fifteen percent. In World War II, to date, it amounts to thirty percent. A fuel technologist has informed the British Parliamentary Scientific Committee, which has been assigned to fuel efficiency research, that there is no reason why, with the technical improvements now existing, the heat value of coal cannot be raised to forty-five percent.

As to the British industrialist, lessons he is learning under wartime austerity conditions will enable him to cut production costs in the highly-competitive post-war period.

Stainless-Clad Steel. The Jessop Steel Company of Washington, Penna., announces the publication of a new catalog on Jessop Stainless-Clad Steel.

Included in this helpful literature is information on analyses, applications, manufacture, fabrication, styles of heads and standard size of sheets and plates. It also gives a comprehensive explanation of the exclusive patented "assembly method" used in producing Jessop Stainless-Clad.

Of special interest to fabricators contemplating the use of this composite metal are the sections on deep drawing, grinding, polishing, cleaning, gas-cutting, riveting, soldering, welding, etc.

Copies of the booklet available without obligation on request.

Coking Tests on West Washington Coals

Assisting in the revival of the coke industry on the Pacific Coast, the United States Bureau of Mines has issued a report describing coking tests conducted on six Western Washington coals, some of which now are supplying a new byproduct plant at Tacoma, Wash., Dr. R. R. Sayers, Director of the Bureau, announced recently.

The research work, which began in 1940, was conducted cooperatively by the Northwestern Improvement Company, The Wilkeson Company, the Continental Coal Company, the College of Mines of the University of Washington, and the Northwest Experiment Station of the Bureau of Mines at Seattle, Dr. Sayers informed Secretary of the Interior Harold L. Ickes.

Preliminary to the construction of a new byproduct plant at Tacoma to serve the coke market of the Pacific Northwest, large-scale tests of coal samples were made in Curran-Knowles coke ovens of the Crow's Nest Pass Coal Company, Ltd., at Michel, B. C., in 1941 and small-scale tests were conducted in similar ovens at West Frankfort and Millstadt, Ill., in 1940 and 1942. The coke was analyzed at the Bureau's experiment station in Seattle which is engaged in a long-range project in furthering the use of Washington coals in the chemical and metallurgical industries of the region.

Samples included McKay coal from the McKay mine at Ravensdale, Rosyln coal from the Roslyn No. 3 mine at Roslyn, and Wilkenson coals from the Commercial No. 3, Wilkeson-Wingate, Bartoy, and Wilkeson-Miller mines, all at Wilkeson.

"All the coals and blends yielded commercial coke," the research workers stated. "The conclusion is reached that these coals or blends of generally similar combinations will yield cokes suitable for domestic, smelter, general industrial and metallurgical, and electrochemical and electrometallurgical purposes. Some highly specialized uses in the electrometallurgical field, especially ferroalloys, desire phosphorus contents much lower than appear possible for these coals. Water-gas manufacture can be carried out with some of the stronger of these cokes, from the standpoint of size of coke, analysis, and ash-softening temperature. The tests indicate also that some of the cokes could be used for foundry and iron blast-furnace purposes if the consumer were to modify conventional operating practices or be willing to accept cokes whose formerly adopted specifications have been modified or altered."

Authors of the Bureau of Mines publication, "Byproduct Coke Oven Tests of Washington Coals," are H. F. Yancey, supervising engineer of the Bureau's Northwest Experiment Station; Joseph Daniels, professor of mining engineering and metallurgy, College of Mines, University of Washington; E. R. McMillan, mining engineer for the Northwest Improvement Company, Seattle; and M. R. Geer, assistant mining engineer at the Bureau's Northwest Experiment Station.

A copy of the publication, Report of Investigations 3717, "Byproduct Coke Oven Tests of Washington Coals," may be obtained without charge from the Bureau of Mines, Department of the Interior, Washington, D. C.

WALTER H. PARKER

Walter H. Parker, Vice President in Charge of Manufacturing, Pittsburgh Equitable Meter Company, died suddenly on Tuesday, December 28, 1943, in his home at Pittsburgh, Pa., from a heart attack following the contraction of pneumonia. He was 51 years old.

Mr. Parker was a graduate of North Carolina State College of Agriculture and Engineering at Raleigh, North Carolina. Prior to becoming associated with the Pittsburgh firm in 1929, he was Chief Engineer for the Fry Equipment Company of Rochester, Pa. During the first World War he served as a Captain in the Air Corps and was honored with a citation for the development of a synchronizing principle for firing bullets between the blades of airplane propellers. During the present war Mr. Parker contributed many valuable innovations in the development and manufacture of medium caliber armor-piercing shot. He was a member of the Pittsburgh Athletic Association and the American Legion.

ARTHUR J. McCLELLAN

Arthur J. McClellan, Superintendent of Distribution for The Manufacturers Light and Heat Company of Pittsburgh and affiliated companies, died January 20th in St. Francis Hospital following an illness of several months.

Mr. McClellan had been associated with Manufacturers for 25 years, having been agent for the company in the South Hills for a number of years before being promoted to his latest position. His business affiliations included the American Gas Association and the Pennsylvania Natural Gas Men's Association.

Osmer and McKinney Join Girdler Corp.

Gas Processes Division, of the Girdler Corporation, Louisville, Kentucky, announces Leon E. Osmer and Melvin H. McKinney as engineers who have recently joined the organization. Osmer, a native of Iowa, has been with the Semet Solvay Engineering Corporation since 1924. McKinney, a native of Texas, has been with Lago Oil and Transport Co., spending much of the time since 1930 in Aruba. Since American entry into the war he has been with Dow Chemical Co. and Sinclair Rubber Co.

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